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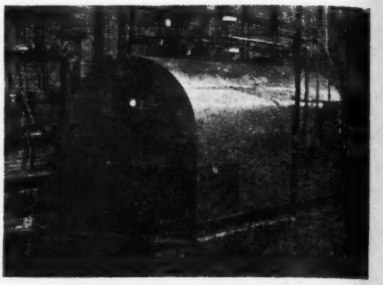

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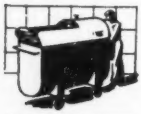

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Acme

"There ought to be a law!" This often spoken lament following fire tragedies sounds particularly pathetic when a governmental agency is directly involved. Ten aged persons died in their beds at the Walker Convalescent Home six miles north of Amarillo, Texas, on Dec. 22, 1950. Caused by ignition of escaping gas from the heating plant, flames were blown through the forced air heating ducts into two one-story wood (former barrack) buildings and a connecting passageway, trapping the victims before they could be moved. While the operator of the Convalescent Home was cited as being "very careful" the buildings were leased by Potter County and the operator had no control over the unsafe conditions existing in the structures or the lack of public fire protection.

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The Quarterly

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Fire Protection Developments In 1950

By Percy Bugbee, General Manager

National Fire Protection Association

The preliminary estimates for building fire loss during 1950 stand at $697,000,000, as compared with $672,500,000 in 1949. In addition, $73,000,000 loss in aircraft, motor vehicles, forests and miscellaneous other fires, brought the estimated total 1950 loss to $770,000,000. If this estimate holds firm, the loss last year was exceeded only by the 1948 loss of $776,000,000.

Some 10,000 people lost their lives by fire in 1950, according to NFPA Fire Record Department estimates. We are still struggling to get more accurate figures on deaths and injuries in fires. Reliable figures are not yet available. During the past year there was an unusual number of fires in small dwellings, both in the cities and in the rural areas, wiping out whole families. Nearly all of these fires were due to heating hazards in the winter time. The great tragedy of such fires is that every one of them could be readily prevented by the observation of common rules of maintenance and operation of stoves and portable heaters.

Probably the fire of the year that attracted the most attention and action was the Davenport, Iowa, hospital fire on January 7 in which 41 persons were killed. This fire, following as it did the tragic Effingham, Ill. hospital fire of the year before, accelerated the activity initiated during 1949 to improve the fire safety of hospitals throughout the country. The insurance companies continued a voluntary inspection of all hospitals as their contribution to improving the situation and at the end of 1950 a very substantial number of the hospitals throughout the country had been inspected and a report made to the hospital authorities. Material issued by the National Fire Protection Association on hospital fire safety was in great demand and received the endorsement of the American Hospital Association.

Another spectacular fire which created nation-wide interest was the fire on a street in Chicago on May 25 where a street car ran into a gasoline truck and in which 34 persons were burned to death. The NFPA Committee on Transit Operations was working on a new draft of standards affecting this transit safety when the accident occurred. It is anticipated that new NFPA standards will be submitted at the 1951 annual meeting.

The major conflagration of the year occurred at Rimouski, Quebec, on May 6, wiping out a large portion of that community with an estimated property loss of $14,000,000. According to NFPA estimates, there were 21 fires in the United States and Canada in 1950 where the property loss exceeded $1,000,000 and there were 243 fires where the property loss exceeded a quarter of a million dollars. The major industrial fire of the year was in a tire and rubber warehouse in North Kansas City, Mo., with a loss of almost $4,000,000.

Civil Defense

Particularly during the latter part of 1950 and unquestionably throughout the year 1951 can be noted a growing general public interest in questions of civil defense. The importance of adequate measures to combat fires in present-day warfare is so obvious as to require no extended discussion. Fire was a major weapon in World War II and the fire effects of atomic bombing present more serious problems than ever before. Those in charge of the public safety of a community and concerned with civil defense programs should start at once, if they have not already started, to evaluate the probable role of their community in any war. Is the community a primary target area, a secondary target, a probable evacuation area, or is it remote from possible involvement?

The classification into which the community falls will indicate the character of the civil defense preparations necessary. Washington has already told the governors and the mayors what cities are regarded as prime targets by our own military experts and in those prime target areas elaborate steps for fire protection are certainly indicated. The probable burning characteristics of the city can be predetermined so that some idea of what could happen under bombing conditions could be predicted. Certainly procedures for the deployment of the municipal fire department and any outside fire fighting aid available should be worked out now. A communication center for fire fighting operations covering the entire area with some overall agreement in advance as to the control of the fire fighting forces in the area is vital. Steps to assure the continuity of water supplies for fire fighting are of great importance as the chances are in any attack the existing water services may be disrupted. Large segments of the civilian population should be trained in extinguishing small fires. The work of the fire guards in Britain during the last war was a tremendously important factor.

Fortunately measures taken along these lines are worth while whether we ever become involved in war or not. Almost equally important is the fact that a strong, well-organized civil defense program is perhaps one of the best reasons why an enemy power would hesitate to attack our country.

Fire Departments

In very many communities throughout the United States and Canada during 1950 the debate over hours and wages of firemen raged throughout the year. There is an evident trend to shorter hours, but no clear trend as to any standard work week as yet. There is a bewildering variety of systems and procedures for the working hours of our fire departments. As I have stated previously in these summary articles, there is a considerable conflict when it comes to shortening the hours and in-

creasing the wages because both procedures cost the taxpayers more money.

Considerable expansion in purchases of municipal fire equipment and fire alarm equipment were evident during the year. It seems probable that there may again develop a shortage of municipal fire equipment in the present emergency period, but it is possible that the importance of fire fighting equipment in our civil defense planning may be recognized and that no shortage will develop.

The firemen's training programs throughout the country continued apace during the year and in general show a steady improvement in quantity and quality. One of the major contributions to firemen's training during the year was the issuance of a pictorial manual on hose evolutions by a joint committee of the NFPA, the International Association of Fire Chiefs, and the Fire Department Instructors Conference.

There was considerable evidence that more and more cities have appreciated the importance of the fire prevention work carried on by fire departments and have strengthened this work through the establishment of fire prevention bureaus and through the conduct of inspections by the rank and file of the firemen in their own districts. It should be evident that the prevention of fires is a prime function of any fire department and is of real value to the community.

The new Fire Administration text just issued by the International City Managers Association will be a contribution to better conduct of our fire departments as this text provides a good summary of the best practices and procedures and is increasingly used by municipal officials.

Legislation

A noticeable trend throughout the year was the large number of communities that adopted various types of ordinances restricting smoking in such occupancies as department stores, theatres, hotels, and other public buildings. The careless smoker is becoming recognized as a menace to society and certainly where he endangers other people's lives and other people's property he should be called to account.

Other interesting legislation adopted during the year was a regulation in the District of Columbia making fires due to carelessness and negligence in hotels, rooming houses, lodging houses, apartments, convalescent homes, hospitals and similar places of abode, subject to a $300 fine. Failure to notify the fire department of any fire or evidence of a fire was made subject to a $100 fine. An elaborate set of new fire regulations was adopted by the state fire marshal in California. Many new technical standards were completely revised or amended during the year by the various committees of the National Fire Protection Association. Among those of particular interest were the Standards of Safe Practice for Hospital Operating Rooms, Recommended Good Practices for the Operation of Self-Service Gasoline Stations, Code for Protection Against Lightning, Tentative Standards for the Storage, Handling and Use of Flammable Liquids and for Warning Labels for Containers of Flammable Liquids, Standards on Foam Extinguishing Systems, Standards for the Storage and Handling of Liquefied Petroleum Gases, Standards on Fire Protection for Motor Craft, new Specifications for Automobile Fire Apparatus, Standards on Municipal Fire Alarm Systems, and on First Aid Fire Appliances.

For many years the National Fire Protection Association has maintained a full-time electrical field engineer to promote the acceptance and adoption of the National Electrical Code and during 1950 because of financial support received from the oil companies and others a new project for a flammable liquids engineer was launched. This engineer will devote his time to the promotion of NFPA Standards pertaining to flammable liquids and to service to municipalities and others in the field of control of fires in various types of flammable liquids.

Considerable progress was made during the year by the joint Committee on Unification of Building Codes made up of representatives of the ten leading national organizations in the field of building code work. The committee is working out agreements on basic definitions, building types, occupancy classifications and floor loadings, all of which will increase uniformity in building code practices.

Public Education

It is with a good deal of satisfaction that we can report substantial progress in the field of public education in fire waste control. A most encouraging factor has been the intensification of interest by the National Education Association in this field and the production by them of a number of very attractive and useful manuals for teachers on the teaching of fire prevention in existing courses of study in the public schools. Certainly if we can teach the younger generations the fundamentals of life safety and fire safety w can hope to some day get away from th disgraceful toll of death and fires that w suffer annually.

Another great contribution was th decision of the Advertising Council t sponsor a year-round campaign on hom fire prevention. This campaign, aimed a the simple causes of fires in homes, ha already attracted nation-wide attention.

The observance of Fire Prevention Week in October exceeded all previous observances of the week in scope and activity. Ample evidence of this is indicated by the fact that in the NFPA's Fire Prevention Week Contest for excellence of the observance, there were this year over 3300 entries. The small community of Atlantic, Iowa, emerged as the national winner in this contest, with Fort Collins, Colo., in second place, and Memphis, Tenn., and Fort Wayne, Ind., tied for third. Winning cities in the National Fire Waste Council Contest for year-round excellence in fire prevention activities for 1949 were, in the various six classes of population, Chicago, Cincinnati, Grand Rapids, Anderson, Ind., Parkersburg, W. Va., and Fort Collins, Colo., with the grand award going to Cincinnati.

There is a growing awareness by the general public of the terrible toll inflicted annually by fires on our people. Because of this, the National Fire Protection Association has had the greatest year of activity in its 55-year history and has faced the greatest demand for services and publications in its history.

State Legislation On Rural Fire Protection*

By John D. Rush, Agricultural Economist
United States Department of Agriculture

Considerable progress has been made within recent years in the enactment of legislation providing for fire-protection service in rural areas. At present 41 States have provided for such activities. Seven States — Alabama, Florida, Mississippi, New Mexico, South Carolina, Tennessee and West Virginia — have no general statutes. But even in these States some protection is afforded to near-by farms as town departments usually respond to calls from outlying areas, especially if human life is endangered.

There are four principal methods of providing rural fire protection: (1) The establishment of special districts, with corporate status, under a board of administrators, to serve community needs without regard to existing political boundaries; (2) township-wide programs, usually under the existing township boards, to provide services in unprotected areas; (3) the county programs, under the county boards, to serve unprotected areas outside of cities and towns; and (4) volunteer fire departments which may be financed in part by general appropriations.

Programs Authorized by States

The laws in 15 States — Arkansas, Arizona, California, Colorado, Idaho, Illinois, Louisiana, Missouri, Montana, Nebraska, Nevada, Oklahoma, Oregon, Vermont and Washington — authorize district programs only. Town-, or township-wide protection only is authorized in 5 States — Indiana, Maine, Minnesota, New Hampshire, and North Dakota. County or county-wide programs only are authorized in Georgia, Texas, and Utah. In Delaware the laws authorize appropriations to volunteer companies serving the general public.

Some States have two or more laws, which provide alternative methods of setting up rural fire departments. In 8 States — Connecticut, Iowa, Kansas, Massachusetts, New Jersey, Ohio, Pennsylvania, and Rhode Island — the laws authorize both district and township protection. Four States — Kentucky, New York, North Carolina, and Virginia — authorize both district and county protection. Three — Michigan, Wisconsin, and Wyoming — authorize all three kinds of programs, district, township, and county protection. Maryland authorizes both districts and appropriations to volunteer companies. South Dakota authorizes both township and county protection.

The laws authorizing fire-protection districts usually outline operating procedures in greater detail than do the laws that provide for protection to existing township and county units. Under the latter legislation, the power to provide fire protection is granted, but many of the practical details are left to administrative officials. For example, procedures are outlined in the district laws for the future annexation of or consolidation with adjoining programs; whereas very little is said about this matter in the legislation providing for

*From an address given to the Farm Fire Committee of the National Fire Protection Association, St. Paul, Minn., Nov. 14, 1950. This analysis subject to revision as more complete data become available.

township- or county-wide protection. The district laws are also more specific regarding the minimum area or minimum assessed valuation that may constitute an operating unit than are the other laws. Only the district laws provide for the maintenance and lighting of streets and the establishment of special improvement sub-districts when parts of the district require more protection than others.

The constitutionality of a few of the State laws on rural fire protection has been questioned. In Virginia, the section of the fire law that allocates part of the tax on premiums collected by "foreign" fire insurance companies to fire-protection services was held unconstitutional on the ground that it lacked equality and uniformity (14 S.E. 2nd 396). Certain sections of the fire laws of Missouri and Indiana have been held unconstitutional either by the courts or by opinions of the State attorneys general. When the district law of Illinois was recently challenged, one of the reasons given was that when the legislature delegated authority to the courts to hold hearings and decide whether to deny or hold an election on a petition to form a district, it had delegated an executive power to a judicial officer. Legislation authorizing rural fire departmen services has even been repealed in a fe cases, as in Kansas, where in 1947 th legislature repealed a 1941 statute author izing county fire departments.

At present 31 States have laws author izing fire protection through the forma tion of special districts; 17 authorize pro tection based on town or township-wid programs; 11 authorize fire protection fo counties. The distribution of these laws i given in Table 1.

Table 2 shows the results of an effor to analyze characteristics of present legisla tion by kinds of programs authorized The purpose is to identify and classify th essential elements involved so that require ments for adequate legislation may be con sidered by those interested in promoting rural protection. In this connection it may be significant that the laws of a few States authorize the administrators of rural pro grams to carry liability insurance on fir trucks, even though the rule of govern mental immunity has long been estab lished. This movement fits into a recog nized trend toward acceptance of com munity responsibility for acts of its agents.

Table 1.—Distribution of States by character of rural fire protection laws and by geographic divisions

Geographic Division	Number of States	No. of States Having Laws	Kind of Programs Authorized[1] Special Districts	Township Protection	County Protection
New England	6	6	4	5	0
Middle Atlantic	3	3	3	2	1
East North Central	5	5	4	4	2
West North Central	7	7	4	5	1
South Atlantic	8	5[2]	3	.0	3
East South Central	4	1	1	0	1
West South Central	4	4	3	0	1
Mountain	8	7	6	1	2
Pacific	3	3	3	0	0
Total	48	41	31	17	11

[1] Some states authorize more than one kind of program.
[2] Includes one State with laws appropriating general funds for volunteer fire companies.

Table 2.—Distribution of laws authorizing rural fire protection by character and by kind of program

(Note: These figures refer to laws, not necessarily to States. Some States have more than one law.)

	Kind of Program		
	Special Districts	Township Protection	County Protection
1. Nature and Character of Legislation:			
a. Has general or state-wide application	31	17	11
b. Has public local application only	4	2	2
c. Law validates formerly organized programs	9	2	0
d. Law brings older programs under new Act	7	1	0
e. Law authorizes judicial review	3	1	0
f. Sections or Act held unconstitutional or repealed	1	0	2
2. Initiation Procedure:			
a. Petition required	32	7	3
(1) By specified number or per cent of residents	20	4	2
(2) By majority of qualified electors	8	2	1
(3) By owners of a majority of property valuation	4	1	0
b. At annual or special town meeting	3	11	0
c. By motion of County governing body	4	2	10
d. By motion of Township governing body	5	7	0
e. Bond or deposit required of petitioners	7	0	1
3. Establishment Procedure:			
a. Notice and hearing authorized	26	4	0
(1) Before County governing body	13	1	0
(2) Before Township governing body	4	2	0
(3) Before Court of jurisdiction	6	0	0
(4) At especially called public meeting	3	1	0
b. Election authorized	23	20	3
(1) At regular or special election	17	9	3
(2) By majority vote at town meeting	4	10	0
(3) By majority vote at public meeting	2	1	0
c. By order or resolution of County governing body	6	1	10
d. By order or resolution of Township governing body	6	3	0
e. By order of Court of jurisdiction	5	0	0
f. Other kinds of district may provide fire protection within its territory	6	2	0
g. Public notice of establishment required	3	0	0
h. State officials must be notified of establishment of program	2	0	0
4. Kind of Administration:			
a. Board of directors or commissioners	22	2	0
b. By Township board	9	16	0
c. By County board	7	1	11
d. By State Board of Forestry	2	1	0
e. By County Fire Commission[1]	2	0	1
5. Character of Services Authorized:			
a. Establish and operate a fire department	32	17	10
b. May contract for fire department services	22	12	5
c. May use services of existing volunteer fire companies	13	7	2
d. May use services of existing independent fire companies	8	4	2
e. May purchase apparatus and arrange for its use	11	8	1
f. May serve outside of regular operating territory	35	20	7
(1) With contract	14	4	2
(2) Without regard to existence of contract	9	7	1
(3) May enter mutual aid agreements for protection	12	9	4
g. Joint protection programs by action of two or more political units	9	8	3

(Continued next page)

[1] Authority of County Fire Commission refers particularly to the maintenance of minimum standards found desirable from the standpoint of an over-all public interest in fire control at the county level.

Table 2.—Distribution of laws authorizing rural fire protection by character and by kind of program

(Continued)

	Kind of Program		
	Districts Special	Protection Township	County Protectio
6. Powers Especially Delegated to Administrators:			
a. To make ordinances to govern functions	22	12	5
b. To make ordinances for fire prevention	14	5	3
c. To participate in fire prevention programs	7	3	1
d. To adopt civil service system for firemen	6	1	1
e. To appoint special appraisers to equalize taxes	2	0	0
7. Expenditures Specifically Authorized:			
a. To insure firemen against accidents, etc	10	2	1
b. To appropriate relief for injured firemen	3	2	1
c. To insure liability of fire department	10	2	0
d. To use fire funds to train firemen	6	3	1
e. To pay outside companies for aid rendered	6	2	1
f. To pay or appropriate funds to telephone companies for switching charges or for fire alarm use	4	2	0
g. To establish retirement system for firemen	4	2	0
h. To use fire funds to pay first cost of election	3	0	0
8. Other Special Functions Authorized:			
a. To provide or rent water systems	15	3	1
b. To provide fire alarm systems	10	5	0
c. To tear down buildings to prevent spread of fire	5	5	1
d. To employ or appoint special fire police	5	5	0
e. To report cause of fire, losses, etc	7	2	0
f. To employ or appoint rescue squad services	7	2	0
g. To maintain streets and roads	4	0	0
h. To light streets, highways	3	0	0
i. To provide sewer system in area	2	0	0
j. To remove snow and ice on roads, streets	1	0	0
9. Character of Area as to Size: Population: Assessed Valuation:			
a. Authorizes protection in rural areas	31	17	10
b. May protect some urban areas	20	13	1
c. Area may be in more than one township or county	13	5	2
d. Minimum or range of population specified	4	3	3
e. Minimum or maximum area limits specified	5	0	1
f. Area must be contiguous	9	1	0
g. Certain rural lands without improvements may be excluded	4	0	0
h. Certain classes of ownership or certain valuations may be excluded	4	0	0
i. Minimum or range of assessed valuation specified	1	1	1
j. Authorization dependent on nearness of city to furnish fire protection	1	1	1
k. Minimum number of residences specified	1	0	0
10. Specific Provisions for Future Needs:			
a. May annex additional territory later	21	0	1
b. For dissolving programs	13	0	0
c. May exclude part of area after hearing, etc	11	0	0
d. May consolidate two or more near-by programs	7	0	0
e. For future annual meetings	6	0	0
f. Special improvement district may be authorized within area of program	3	0	0
g. Law provides for future change in administrative form of government	1	0	0

(Continued next page)

Table 2.—Distribution of laws authorizing rural fire protection by character and by kind of program

(Continued)

	Kind of Program		
	Districts Special	Protection Township	County Protection
11. Methods of Financing Programs:			
a. Vote required on amount of tax levy	15	13	3
b. Law specifies upper limit of tax levy	20	6	1
c. Administrators authorized to borrow money	18	7	1
d. May issue bonds	18	4	1
e. Upper amount of debt limit imposed	13	4	2
f. May charge fee for rendering outside assistance	10	4	0
g. Amount or time limit on bonds	10	2	1
h. Upper limit on annual expenditures imposed	8	3	1
i. May pay outside company for rendering aid	6	2	1
j. Law authorizes public appropriations in lieu of taxes	3	4	4
k. May serve outside of regular territory free; no charge	4	3	0
l. Tax rate may vary if benefits in area differ	6	0	0
m. May sell tax-delinquent property	7	0	0
n. Authorized to set up debt reserve fund	3	1	0
o. Authorized to establish special control funds	3	1	0
p. Authorized to set up depreciation account	1	1	0
q. Authorized to use part of fire insurance company premium tax	1	1	0
r. Authorized to use part of liquor permit fees	1	1	0
s. Authorized to accept gifts, donations, etc.	6	2	1
t. Authorized to use part of motor vehicle registration fees	2	0	0
12. Cooperation or Coordination of Programs:			
a. Authorizes State Fire Advisory Board	4	2	2
b. Authorizes Forest Fire Control Interstate Compacts	5	5	1
c. Authorizes state-wide cooperation	4	2	0
d. Authorizes county fire commission or county cooperation	5	1	3
e. Authorizes association of fire protection districts	1	0	0
f. Authorizes township cooperation or coordination	3	3	0
13. Other Related State Legislation:			
a. Has State arson law	28	12	8
b. Has law regulating construction of buildings	20	11	6
c. Has State Fire Marshal law	20	8	6
d. Has law regulating flammable materials	20	10	3
e. Fire drills required in schools	20	8	3
f. Has law regulating use of liquid petroleum products	13	7	5
g. Law authorizing teaching fire protection in schools	16	5	2
h. Has State electric code	12	6	2
i. Has State building code	5	3	1

Fire Protection Districts In Illinois

By N. G. P. Krausz*
University of Illinois

Each year between 3,000 and 4,000 farm people in the nation are killed and many more thousands are injured in fires. In terms of money, farm property destruction approaches $100,000,000 annually. This tremendous loss can be and is being reduced in many states by organized districts which furnish fire protection to rural areas that is comparable with, and in many cases superior to, that furnished in cities and villages.

In some states organization of fire protection districts by township has seemed best. In a few cases county-wide districts are being used. One advantage of following congressional or political unit boundaries is readily apparent: Everyone receives protection. One disadvantage is also obvious: The firehouse is generally located in a village which may not even be close to the geographical center of the district.

A fire protection district act was passed by the Illinois legislature in 1927. A few districts existed many years before this act as corporations, cooperatives, or by contract with a city or village fire department. Existing principally by donations, the cooperatives often found themselves short of funds when new equipment was needed. One of the reasons for the fire protection district act was to assure adequate funds to buy equipment and maintain it. Also, it seemed desirable for everyone in the district to pay part of the cost rather than to depend on donations from a few — the few being the people who had had fires and were thus least able to contribute.

In Illinois a fire protection district may be any size, and it need not follow either township or county lines. A city or village may be, and often is, included. Three trustees appointed by the county judge govern the district. Funds for the purchase of equipment and for maintenance and operation are obtained by levying a tax up to .125 per cent on personal and real property in the district.

In June 1949, 200 questionnaires were sent to fire protection districts of Illinois with the purpose of determining the cost of these districts to members, and of making a study of the benefits, such as reduced fire losses, reduced insurance rates, building inspections, and improved equipment available for fighting fire. Also, it was thought desirable to study the legal sufficiency of these districts and try to find the essentials of sound organization.

The 64 questionnaires that were returned should be an adequate sample upon which to base several observations. Forty-eight counties are represented by these 64 districts. This is 83 per cent of the counties to which the questionnaires were sent.

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Virgil Niebur

This barn fire took with it some 800 bales of newly cut, green hay. The structure was only about a year old when the fire occurred on Sept. 2, 1947, at Breese, Illinois. Lack of water handicapped firefighters who responded to the 6:30 A.M. alarm.

Twenty-five horses were killed in this $80,000 fire in Carpentersville, Ill., in July 1949. The entire building was involved when the fire department arrived about 1:00 A.M. The only available water supplies were from booster tanks.

Fifteen additional fire protection districts were contacted personally, and an opinion on operating efficiency in rural areas was obtained from one of the trustees or the fire chief. The most striking observation on these personal visits was the large amount of new and expensive equipment that the districts have purchased. That is understandable, however, when one looks at the rapid growth of these districts. In 1944 only 100 districts had been organized in Illinois. In 1950 it is estimated that 300 such districts exist.

Several state and private organizations were contacted personally to obtain information not otherwise available. These include the Illinois Inspection Bureau, State Fire Marshal's Office, State Department of Revenue, National Board of Fire Underwriters, and Illinois Association of Fire Protection Districts.

Fires and Property Damage

A typical announcement was issued from the State Fire Marshal's Office in June 1949: "691 fires reported in downstate Illinois during June resulted in fire damage of $1,235,679. 74 of the fires were reported from farms. . . . The farm fires caused damage estimated at $163,224."

This appalling loss to Illinois agriculture by fire in a period of only one month can be attributed to four causes: (1) lack of knowledge of the cause of farm fires, (2) faulty farm building, (3) inadequate fire prevention practices, and (4) inadequate fire protection and water supply. In order to obtain some of these data from fire protection districts and to estimate the ratio of fires to buildings and the number of fires per capita, about one-fourth of the questionnaires sent out contained fire loss questions.

Of the 64 questionnaires returned, three districts made no report on fires. The 61 districts that reported had a total of 880 fires during the year; 216 of them occurred in buildings in cities or villages within the district, 301 in farm buildings, and 363 in other than buildings in both urban and rural areas, such as automobile, grass, straw, and electrical. Two districts reported that they had no fires.

The 216 fires that occurred in cities or villages were distributed as follows: homes, 103; garages, 25; business places, 30; public buildings, 8; and other buildings, 50. The 301 fires reported in farm buildings were as follows: homes, 154; barns, 61; tool sheds, 18; hen houses, 14; and other buildings, 64. Other fires were: electrical, 3; auto, 49; grass, 169; cob piles, 2; straw piles, 12; and miscellaneous, 128, with no distinction made between location in urban or rural areas.

Although 61 districts reported on the number of fires for the year, not all districts had fires in both villages and country. Thirty-nine districts reported damage from fires in villages during the year from June 1948 to June 1949. The total amount of damage was estimated at $73,035. Total fire loss was less than $1,000 in 26 (67 per cent) of the districts, between $1,000 and $5,000 in 8 districts, between $5,000 and $10,000 in 4 districts, and between $10,000 and $20,000 in 1 district.

Fifty-one districts reported damage from fires on farms. The total amount of this damage was $331,688. Thirteen (25 per cent) districts reported a total damage of less than $1,000; 22, from $1,000 to $5,000; 9, from $5,000 to $10,000; 4, from $10,000 to $20,000; 1, from $20,000 to $30,000; and 2, from $40,000 to $50,000.

A disastrous farm barn fire occurring in South Burlington, Vt., on Aug. 13, 1948, shows the effects on a metal clad roof when 200 tons of hay are burning in the loft. The owner smelled smoke about 1:50 P.M. but fire equipment had to travel 4 miles to reach the scene and then had to dig a trench to secure water from a near-by river, no prearrangements for fire department access having been previously considered.

Total damage on farms was more than 4½ times as great as that in villages. But the percentage reporting fire damage under $1,000 in villages was almost three times as great as the percentage reporting such damage on farms. The fact must, however, be recognized that the final test of a fire department's operating effectiveness — particularly in rural areas — is not always the actual fire loss. A better test is how much loss was prevented. Many factors that affect fires differ in urban and farm buildings, including occupancy, contents of buildings, structural materials, and fire hazards.

One hundred eighty-four *building* fires were extinguished in villages and 212 on farms. In villages fires were put out in the following places: homes, 96; garages, 20; business places, 26; public buildings, 7; and other buildings, 35. Those on farms were in homes, 127; barns, 30; tool sheds, 11; hen houses, 4; and other buildings, 40.

Some interesting facts are shown by the number of buildings totally destroyed in villages. Only 3 garages, 1 business place, and 2 other buildings were reported as completely destroyed. Some building fires were presumably extinguished by means other than the fire department. On farms, 17 homes, 24 barns, 8 tool sheds, 10 hen houses, and 11 other buildings were totally destroyed. These account for a major part of the total damage from fires on farms.

Of a total of 517 building fires, 257, or 50 per cent, were in homes. Forty-eight per cent of such fires were in village homes compared with 51 per cent in farm homes. Twenty per cent of the building fires in rural areas were in barns, 7 per cent in tool sheds and hen houses, and about 20 per cent in other farm buildings.

No questions were asked about the types of materials used in construction. However, it may be safely assumed that most of the burned buildings were wood.

A barn fire in Connecticut shows the tragic results of lack of water. This loss, occurring in February 1945, was caused by hay winding around the rotary blades of a hay chopper. The excessive friction set fire to the hay which was being blown into the barn loft. The loss was estimated at $28,600.

Only 4 districts reported that one or more fires had spread to near-by buildings. Two districts had fires spread twice; 1 district, three times; and 2 districts, four times.

Although 61 districts reported having fires, only 58 gave the number of farms in their district, and only 57 gave the number of village homes. The figure 61 was therefore used as a base, and a correction factor was applied to both farm and village homes, bringing the total farm buildings to 88,506 and the total village buildings to 35,985. With 301 farm building fires and 88,506 farm buildings, the average was 3.4 fires per 1,000 buildings for the year. Cities and villages reported 216 fires, an average of 6 per 1,000 buildings.

In addition, there were 363 other fires, such as auto, grass, cob, straw, and electrical, which were not broken down between rural and urban areas. The average was 2.9 fires per 1,000 buildings in both rural and urban areas.

Fifty-eight districts reported a total of 15,300 farmsteads. The 1945 census showed 3.4 persons per farm dwelling. On that basis the 58 districts would have a farm population of 52,020. When this figure is corrected to include 61 districts, the total is 54,713.

Using 54,713 as the farm population for 61 districts and 301 as the number of farm building fires in these districts gives a ratio of one fire for every 182 farm people per year, or 5½ fires per 1,000 persons. Other fires, such as meadow, grass, and cob, were not divided between rural and urban, but three-fourths of the total number may arbitrarily be assigned to the rural area. This gives a total of 571 farm fires, which is one for every 96 farm people, or 10.4 per 1,000.

Cost of Operation

The 1947 figures are the latest ones published by the State Department of Revenue to show assessed valuation and tax extension for fire protection districts. The total amount of tax extended against farm lands in 1947 was $189,732, which is six times as much as was assessed against city lots ($31,626). The average is about $4,300 per district for farm lands and $719 for village lots. With an average of 264 farms and 236 village homes per district, the average tax would be $16 per farm and $3 per city or village lot (including improvements but not personal property). Tax extensions for 1948 were nearly the same as for 1947.

There is a great deal of controversy because of this apparently inequitable distribution of taxes between farm and city

people. The farmer argues that he is paying taxes on his entire farm, most of which is indestructible and should not be taxed for fire protection purposes; whereas the city or village resident who owns a lot, home, and garage pays a fire protection tax on only a very minor portion of his property which is indestructible.

This argument is only partially sound, however. On the other side of the picture, the farmer must evaluate the three following factors:

1. Generally all of the volunteer firemen are men located in the city or village. Most of them are willing to leave their places of business or homes at any time of day or night to go to a farm fire.
2. Compensation to these men is usually very small compared with the time and risk involved.
3. Trips to fires in the country take longer and are more costly than trips to fires in the city. Also, there is usually more damage to equipment and clothing because the water obtainable in the country is often muddy and contains sediment or sand.

Insurance

The Illinois Inspection Bureau is the official fire insurance rate-making body in Illinois. Upon request from a fire protection district, the bureau will send out an agent to inspect and classify the district. Certain requisites must be fulfilled before a district can be classified "A" or "B."

Fire insurance rates are reduced according to the class in which the district falls. For example, on May 31, 1948, the insurance rates for a Class A department were reduced 6 cents for one year, 15 cents for three years, and 24 cents for five years on each $100 of fire insurance. In a Class B department the reductions were 3 cents for one year, 8 cents for three years, and 12 cents for five years on each $100. In both classes the risk must be located not more than 10 miles from the headquarters of an approved rural fire department, this distance to be measured over highways capable of carrying fire-fighting apparatus, and must be provided with telephone.

In order to qualify for a Class A rating, the farm must be provided with an artificial water supply of not less than 3,000 gallons in a cistern or reservoir which is maintained for fire department use only. In April 1949, 26 districts had qualified for a Class A rating and 30 districts for a Class B rating. Specifications for Class A and B rural fire departments can be obtained from the Illinois Inspection Bureau, 309 West Jackson Boulevard, Chicago 6, Illinois.

Of 55 districts that reported on insurance, only 14 stated that the rate on farm buildings had decreased; 41 reported no rate decrease. The 14 that reported decreases indicated a saving of 2 to 7 cents per $100. At an average of 5 cents, that would mean a saving of $5 a year for a $10,000 policy.

In each fire protection district which has a fire department established and maintained by municipal or fire protection district ordinances, every corporation, company, and association that is not incorporated under the laws of this state and that is engaged in selling fire insurance in the district must pay to the secretary of the district, for the maintenance, use, and benefit of the fire department, a sum not to exceed 2 per cent of the gross receipts received from fire insurance upon property situated within the district.

Each fire protection district may prescribe by ordinance the rate (up to 2 per cent) of the tax or license fee to be paid by the insurance company. The payment is based on the amount of premiums received during the year ending on the first day of July.

Fire Prevention Inspections

The best way to reduce fire damage is to reduce the number of fires. The best way to reduce the number of fires is to carry on a constant fire education program accompanied by periodic inspection. Such inspection should be made by a person qualified to detect all types of fire hazards in all types of buildings. He might be a member of the fire department. If there is no qualified person in the department, someone should be employed for the task. Sixty-three districts responded to the question: Are farm buildings inspected periodically for fire hazards by a member of the fire department? Six answered yes and 57 answered no.

Every building in a fire protection district should be inspected at least annually, and preferably semi-annually. A check sheet which is adaptable to all types of buildings should be made out in duplicate for each building. One copy should be left with the person in possession, or a report should be made at a future date. The other copy should be kept in a file at the district headquarters. If the building is a farm building occupied by a tenant, three copies should be made and one copy sent to the landlord.

This procedure will naturally involve some expense, but if put into effect it should save thousands of dollars of property from fire damage.

Equipment and Maintenance

Fifty-three districts reported the purchase of 58 fire trucks for rural use at a total cost of $545,735, or an average of $9,409 per truck. Two trucks cost between $1,000 and $5,000; 38, between $5,000 and $10,000; 17, between $10,000 and $15,000; and 1, between $15,000 and $20,000.

Sixty-three districts reported 88 fire

The Bement Fire Protection District (NFPA member) covers a 90 sq. mile rural district near Decatur, Illinois. Their 22 members plus Chief Roy Allen and Asst. Chief James E. Crim have attended the Illinois Fire College and the Decatur Fire Dept. drill school as well as having their own training program. Call firemen are paid $5 per meeting and per fire.

Fire equipment of the Polo Fire Protection District includes a 1930 Boyer 500 GPM pumper (used as a salvage and first-aid truck), a 1939 General (on a Chevrolet chassis) 500 GPM pumper, a 1949 International KB6 Tanker having 1,200 gal. capacity, and a 1949 Mack (Type 75) 750 GPM pumper with a foam or wet water proportioner. This photo shows their new $33,000 fire station dedicated during 1950.

trucks in use in rural areas. Forty-five districts have one truck for rural use, 12 have two trucks, 5 have three, and 1 district has four. Eleven per cent of the trucks were purchased from villages and 89 per cent from companies. Fourteen companies were listed as having sold fire trucks to these districts. It is interesting to note that one company sold 26 of the total number; the next closest sold 11.

Since many of the districts have new equipment, most of them have given no thought to a replacement program. City and village departments with older equipment are now finding themselves with outmoded apparatus and no money to buy new trucks and pumps. Even though the fire truck travels few miles, the motor operates under conditions different from those of the ordinary truck motor, and its life is often shorter. Pumping equipment has a long life but becomes obsolete with new developments. A program for the retirement and replacement of old equipment is important in keeping equipment up to date so that the best possible protection can be provided. It would be well for each district to consider such a program.

The centrifugal pump has been the most popular type on fire trucks. Fifty-eight per cent of the trucks reported had this type of pump, 23 per cent had a rotary type, and 16 per cent piston type.

Most of the pumps were classed as low pressure. Forty-five per cent of the districts had a low-pressure pump with a combination fog nozzle, 35 per cent had a straight low-pressure system, 19 per cent reported a high-pressure fog system, and 1 per cent had a chemical system.

The percentage of high-pressure pumps is increasing each year. Districts that have such pumps find them very effective because they use a minimum of water and cause little water damage.

Districts that have purchased other types of pumps are quick to say that high-pressure fog is not effective in case of a conflagration and that full-nozzle streams with reasonable penetration and volume are needed. At least one company has announced a pump that is convertible from high-pressure fog with a small-diameter hose to a larger hose that throws a stream of water at ordinary pressures.

Ladder training in the Abingdon Fire District (Illinois) shows three-piece aluminum ladders, one having a double pole attachment. This District, headed by Chief J. O. Sims, protects Abingdon (population 3,500) and three other small towns and lake resorts.

The use of "wet water" has produced some spectacular results, and some trucks now carry enough solution for 500 to 1,000 gallons of this water. Wet water is said to be from three to five times more penetrating than ordinary water.

Most of the districts reported that their fire chief did the maintenance work on the trucks. In most cases it is possible that he received help from the firemen and the driver. Sixteen districts reported that they employed a mechanic to do the maintenance work on the fire trucks.

Road and Maps

Road mileage generally varies in direct ratio with the size of the fire protection district. Since for insurance purposes no point in the district should be more than 10 miles from the fire station, total mileage in very few cases exceeds 200. Thirty-one per cent of the districts reported 100 miles of road in the district; 20 per cent, 150 miles, 17 per cent, 200 miles, 12 per cent 75 miles; and 1 district reported only 10 miles.

On the average, three-fourths of the total mileage was improved (gravel, oil, or pavement). This figure varies considerably between areas in the state, usually corresponding to the assessed valuation in the county and the amount of taxes collected for road purposes. Only 16 per cent of the districts reported that they had 150 or more miles of improved roads, 63 per cent had 100 or more miles, and 21 per cent had less than 70 miles.

The extent of improved roads is important when the organization of a fire protection district is being considered. Without all-weather roads, fire trucks cannot be used effectively. It is also necessary to consider the condition of farm lanes and lanes to farm ponds.

Sixty-eight per cent of the districts have their fire station within two miles of the geographical center of the area. Thirty-two per cent of the district fire stations were two to five miles from the geographical center. The greatest concentration appeared near the two-mile mark. Fire experience has shown that time lost in covering a distance of more than 10 miles generally results in total fire loss.

Various devices are used to locate fires and nearest water supply. The most popular is both a wall map and a card file. Each farm, and in a few cases each building in the farmstead, is plotted on a large map. Each farm has a number or a combination of a letter and number. Sometimes the district is divided into sections and each section is assigned a block of numbers so that when a fire is reported very little hunting is necessary to find the farm.

Every farm home must have its number conspicuously displayed, preferably on or near the telephone. One telephone company refused to allow any sign or tag to be placed on the telephone, but most companies will cooperate. One district has placed a large permanent metal plate with this number on the entrance to each farm, both for reporting purposes and for the benefit of the firemen.

Some districts use only a map, others use only the cards; too many rely on the fireman's familiarity with the district. In answer to the question: Have you a map or cards showing location of each source of water in the rural area? 32 districts answered yes and 32 answered no. Either a map or a card system should be provided, both in the fire station and on each truck.

Communications

Fifty-six of the 64 districts have a siren mounted either at the fire house or at some central location in the village (such as the telephone exchange) to alert firemen. Two districts have large bells, and four have an alarm in the home of each fireman. The two having no fire signals were new and had probably not yet received all of their equipment.

Thirty-five districts reported that they used the telephone in addition to other means of alerting firemen. Usually some special arrangement is made with the local operators to keep the names and telephone numbers of all firemen on a special list so that they can be called immediately when a fire is reported or the alarm is sounded. Special rings are sometimes used to indicate a fire, such as 6 shorts or 4 longs. Also the method of sounding the siren sometimes indicates to firemen the particular section of the district in which a fire has started.

The questionnaire asked each district to estimate the percentage of farm homes having telephones. Only three reported that 100 per cent of the farm homes had telephones; 28 of the districts estimated 90 per cent; 14 estimated 75 per cent; and 17 estimated less than 60 per cent.

Lack of effective and speedy communication would seem to handicap a large percentage of the fire protection districts. When farmers having no telephones were asked how the firemen learned of fires on their farms, their only answer was that neighbors are often fairly close and calls can be made from there. This seems to be playing a game of chance.

Many rural telephone systems have operators rather than dial systems. Occasionally a considerable amount of time is lost in getting a fire call through when a district is in several telephone exchanges. Although it is best for the district to stay within the limits of one exchange, this point is not too important, since fast communication by telephone through more than one operator should be merely a matter of educating both the operators and users of the party lines.

Water Used

Almost all districts indicated that they depended on more than one source of water supply in rural areas. The following sources were checked on the questionnaire: cisterns, 51 districts; shallow wells, 42 districts; ditches and streams, 38 districts; deep wells, 24 districts; and ponds, 21 districts.

There is great variation in the amount of water carried by fire trucks, although most of them have a capacity of 400 to 600 gallons. Eighty per cent of the districts reported a capacity of 400 to 600 gallons;

After small cisterns were pumped dry, water had to be relayed from a creek nearly 1½ miles away to stop the spread of this fire near Wyomissing, Pa., Sept. 3, 1942. Six pumpers were connected in series to relay the water to the stricken property. Employees succeeded in removing livestock but two barns were totally destroyed.

10 per cent, between 800 and 1,000 gallons; and another 10 per cent, only 200 gallons.

Eleven per cent of the districts reported that they had a separate water supply truck and in some cases carried a small suction pump in order to replenish the water in the tank from near-by wells or ponds. One district said it had a contract with a near-by milk plant to use its water supply truck. Several districts intend to purchase a separate tank truck in the near future. This would appear to be desirable. Water weighs 8⅓ pounds per gallon, and even many of our better rural roads are in poor condition several months of the year. Overloading may result when large quantities of water are carried on the truck in addition to hose, equipment, and firemen. A stuck truck is of no use.

To the question: Has your district taken any steps to provide additional water for fire protection? 43 districts answered no and 21 answered yes. Eight reported that cisterns were being installed. Seven had installed tanks and fire plugs. Three reported that ponds were being constructed, and three others said that additional wells were being dug.

Answers to the question about gallonage of water used per fire varied because of the difference in types of equipment. High-pressure pumps with a fog spray used the lowest amount — 100, 200, or 300 gallons. These trucks generally carry 300 or 400 gallons, and this amount seemed to be adequate to put out the fire. One advantage to this type of equipment therefore is that the total water supply needed can usually be carried on the truck.

Thirty per cent of the districts reported that they used 200 gallons of water or less per fire; 38 per cent, an average of 400 gallons; 26 per cent, between 700 and 1,000 gallons; and 6 per cent, between 1,500 and 2,000 gallons. These figures would lend some support to the idea of constructing cisterns with a capacity of 2,000 to 3,000 gallons on farms.

Firemen and Trustees

Because of the expense, most fire protection districts are unable to employ full-time firemen. Only 10 reported having full-time firemen: 3 districts have one, 5 have two, 1 has three, and 1 has five.

The number of volunteer firemen per district varied from a low of 10 to a high of 30. Eight per cent of the districts have 10 to 15 volunteers, 33 per cent have 15 to 20, 25 per cent have 20 to 25, and 32 per cent have 25 or more. These figures indicate that the number of trained firemen responding to a fire meets the suggested minimum requirement of five. In most districts this affords a considerable factor of safety.

Twelve districts reported that someone slept in the fire house overnight: 7 districts reported one, 3 reported two, 1 reported three, and 1 reported four.

It would seem desirable to have one person on duty at the fire house both day and night, but many departments have an arrangement which approximates this ideal. Generally the fire house is located in or very near the business district of the village. A volunteer driver and alternate are selected from a near-by garage, filling station, or other business. Often apartments or homes are also located near the fire house, making at least two persons quickly available when the siren sounds, day or night. By the time the driver opens the building door and starts the engine of the truck, other firemen generally arrive. An average of 7 to 10 firemen answer calls.

There is great difference between districts so far as paying firemen is concerned. A number pay on the basis of number of fires, and payment generally ranges from $1.00 to $4.00 a fire. There is some variation between the rate for day and night calls and also between city and rural calls.

As an incentive to get good attendance at meetings and practice drills, a number of districts pay, in addition, $1.00 to $4.00 per meeting or drill attended.

Another method of payment is based on hours on duty, the payment increasing for each hour after the first. A few districts pay on a monthly or a yearly basis — usually a flat sum per month or year.

In three districts the fire chief receives the following amount in addition to the payment received by the fireman: $20 a month, $50 a year, and $75 a year. Other districts reported various pay schedules, some annual, some by the hour (fire fighting) and others by the number of fire calls with rates established per call.

In 56 districts the fire chief is responsible for training the firemen. One district reported that the truck driver trained the firemen, and 7 said the trustees conducted this training. A few districts occasionally brought in outside speakers, and whenever possible a demonstartion was given. The demonstration periods should include practice by firemen in the district.

Most of the training of firemen takes place at monthly intervals. Only 3 districts reported training at intervals longer than one month apart; 14 give the training on either a bi-weekly or a weekly basis.

A board of trustees consisting of three members is appointed by the county court to govern and control the affairs and business of the fire protection district. Not more than one trustee may be from a city or village in the district unless that city

or village has over 50 per cent of the population of the district. After the district has been organized for three years, each trustee holds office for three years, commencing on the first Monday in May after appointment. Each must give bond in such sum as the court determines, and security for the bond must be approved by the court.

A majority of the board constitutes a quorum to do business. The board may appoint a fire chief and such firemen as it considers necessary, who will hold their positions at the pleasure of the board. The board may also prescribe the duties and fix the compensation of all officers and employees of the district. Members of the board may not receive more than $50 per year. Any vacancy on the board of trustees is to be filled by appointment by the county court.

A frequent criticism of the Fire Protection District Act is that the duties of the trustees are not clearly defined. Although the act mentions some duties specifically, most of them are outlined in only general terms. To date at least one unsuccessful attack has been made in an Illinois circuit court on the constitutionality of the Fire Protection District Act. The plaintiff alleged that the act was "indefinite and incomplete." Amendments to the acts in 1949 apparently influenced the decision of the court.

Most districts no longer ask for a donation or for a fixed sum when making a fire call. This action is based on the theory that everyone is receiving protection and should pay maintenance and operation costs regardless of whether they have had a fire. However, a sizable group of districts claim that the average taxpayer should only pay a tax to maintain equipment and that the individual having the fire is receiving an additional service from the firemen for which he should pay. Sometimes this charge is a fixed amount, and the money so received is used to pay the firemen.

Probably a larger group of districts fall between these two categories. These districts pay firemen a fixed sum per meeting or per fire call, but use any donations to buy special equipment in the fire house, such as recreational equipment, or to pay for an occasional dinner or an annual fireman's ball.

Suggestions

1. Rural communities must be made conscious of the principles and practices involved in rural fire prevention. Fire departments should be regarded as fire-prevention as well as fire-fighting agencies, and their budget should be planned accordingly.

A fire prevention committee should be set up within the district, among the fire department personnel, or at the county level. Fire hazard check sheets should be filled out by a qualified fire inspector (preferably a member or members of the fire department) at least once a year, and a report should be made to property owner and to tenant, if any. An occasional contest to determine who had the fewest fire hazards might be used to create interest in correcting such hazards.

2. More community spirit is needed. Town-country meetings would help to create teamwork. Rural Youth and 4-H Clubs are frequently looking for suggestions for projects that will benefit the community. Give them some suggestions about what they can do to help prevent fires, and you may be surprised at the results.

3. Fire prevention districts should urge all farmers to have good lanes and telephones. These two things will cut down fire losses.

4. At least one rural fire department in the state operates a free emergency ambulance service. This vehicle is equipped with first-aid kits, resuscitator, and a power boat on a trailer.

5. Each district should have a replacement program for worn-out and obsolete equipment.

6. Individual property owners know too little about home fire-fighting equipment. Districts might make up recommended lists of such equipment with prices. Perhaps the equipment might be bought in quantity at a discount.

7. Many small communities have no municipal water system. Incorporation is a requisite for a municipal system. The law has recently been changed to permit contiguous areas of less than two square miles, with at least 100 inhabitants, to incorporate as villages. Although there are advantages to incorporation besides improved fire protection, a central water system with fire hydrants is certainly one of the major considerations.

8. In the more populous areas the use of radio to supplement the telephone should be seriously considered in fire prevention and control.

9. Every district should carry both public liability and workmen's compensation insurance.

10. Some states have laws providing for the organization of fire districts on a county-wide basis. This type of organization may not be ideal, but it certainly does have some merit. At present a great number of boundary lines follow no particular course and make little sense, except that the 10-mile limit must be observed for insurance purposes.

Today there is no valid reason for excluding many farms from the benefits of fire protection. Whether more districts should be organized on a community or township or county basis has not yet been determined.

11. More districts should meet the requirements of the Illinois Inspection Bureau for a Class A or B rating. This would reduce insurance rates and make it easier to collect the 2 per cent tax on foreign fire insurance companies.

Fires, such as this one which started in the Starr Department Store in Zanesville, Ohio, Dec. 9, 1950, not only destroy high valued property but also pose a serious life hazard to our country's fire fighters. During 1950, 17 firemen were killed fighting 243 "large loss" fires reported in this analysis. At this Zanesville fire, six firemen were hospitalized but fortunately none was injured seriously. Advanced fires in large area department stores lacking automatic protection and enclosures around vertical openings, are particularly dangerous to combat. The twelve "large" department store fires occurring this year (see pages 217-219) should be particularly noted.

Large Loss Fires of 1950 and Their Lessons

An NFPA Staff Study

During 1950 there were 243 fires in the United States and Canada with individual losses of $250,000 or more producing $152,593,000 loss. These fires representing less than one-half of one per cent of the total number of fires were responsible for 20 per cent of the total fire loss. The number of large loss fires in 1950 increased 12 per cent over the previous year and caused 26 per cent more damage.

There were 200 fewer fatalities in the 1950 large loss fires than in those of 1949. However, the two largest loss-of-life fires (41 killed at the Mercy Hospital fire, Davenport, Iowa, January 7 and 34 killed in the street car-gasoline tank truck collision and fire, Chicago, May 25) did not involve property losses of $250,000 and were thus not included in this record.

These large loss fires, by virtue of their size and importance, have received in most instances careful scrutiny by investigating authorities and have thus been reported to the NFPA in sufficient detail and accuracy to permit analysis. The application of the lessons from these fires will accomplish a reduction in the number and serious effects of fires of all magnitudes.

Acknowledgment

It is only possible for the NFPA to present this study because of the loyal support of its members who have supplied, without financial remuneration, reports on major fires occurring in their localities. Our appreciation for their help is most sincere.

Many fires reported in the press at the time they occurred as involving losses in excess of $250,000 are not included in this article. Over 180 such fires have been eliminated based on revised estimates supported by authenticated subsequent data. Other losses, originally reported less than $250,000, have been included because of later upward revision.

Since this type of study is planned as an annual feature of our January QUARTERLY, all NFPA members and readers are urged to volunteer reports on fires about which they have information.

It has been necessary to eliminate from this compilation a large number of fires (this year over 180) originally reported as involving a loss of $250,000 or more, but which, by careful checking of actual property damages, were found to be of lesser magnitude.

Special comment is also pertinent with respect to the loss figures assigned to the fires that are reviewed in this study. Every effort has been made to verify the estimates given, but the loss figures show *only* the general magnitude of the damages sustained. All figures represent an estimate of the actual fire losses with the exception of those cases where the only loss figures available to the Association were insured values. In certain cases (indicated by a "†" after the figure given) business interruption insurance losses are included in the over-all estimate. It is unfortunate that means are not available to evaluate this type of financial impact on all types of properties sustaining fire losses so that more realistic and consistent loss estimates could be published. Actually, there are many indirect losses from fires due to interruption of business, destruction of records, uninsurable replacement values, and disruption of personnel which cannot be figured in dollars and cents.

but also pose a serious life hazard to our country's hospitalized but fortunately none was injured seriously. As to the twelve "large" this analysis. At this Zanesville fire, six firemen were hospitalized around vertical openings, are particularly dangerous to combat. ment stores lacking automatic protection and enclosures department store fires occurring this year (see pages 217-219) should be particularly noted.

The forest fire losses were supplied to the Association from the various regional offices of the U. S. Forest Service or the respective State Forestry Divisions.

PRINCIPAL OCCUPANCY BREAKDOWN

	No. of Fires by Years				
	1950	1949	1948	1947	1946
Manufacturing	83	67	92	64	58
Transportation	31	23	20	22	20
Mercantile	29	26	36	26	24
Storage	23	43	52	45	44
Habitational	11	11	9	6	11
Miscellaneous	66	48	59	39	30
Totals	243	218	268	202	187

Geographically, the *structural* large loss fires occurred in 40 of the 48 states, Hawaii and Alaska, and in six Canadian provinces. The largest number occurred in California which suffered 19 of these "biggest of the year" fires. Pennsylvania and Illinois each had 15, New York State, 14, Ohio, 13. Canada sustained 23 of the major structural losses.

As indicated in Table No. 1, all broad classes of occupancy experienced large loss fires. There was a notable increase in the number of fires in manufacturing plants in 1950 and a substantial decrease in the number of fires in warehouses. There were eight more large loss school fires than in 1949 and an increase of six disastrous lumber yard fires, not including two conflagrations that originated in lumber yards.*

Tables

In the Tables starting on page 252, we present some of the more pertinent statistics concerning the 212 major structural fires. The reader is urged to study this material and to apply the obvious lessons to properties under his jurisdiction.

As in previous years over 60 per cent of all the fires occurred during hours of darkness. Half of the large fires occurring in manufacturing plants originated during operating periods when detection was presumably prompt. This fact indicates that any investment made for prompt extinguishment, such as automatic protection and organization of employees into effective fire brigades, is amply justified.

More than one-third of the fires occurred in towns having less than 5,000 population or in locations outside city limits in contrast with the less than 20 per cent that occurred in cities of over 100,000 population where high property values are concentrated. The comparatively weak fire protection service noted in many small communities explains in part the disproportionately large number of fires in the small towns.

As in 1949, two-thirds of these serious fires were first reported by telephone. Fifteen per cent were transmitted via street box.

While 61 per cent of the fires started from unknown causes, 68 per cent of the fires of *known* cause could have been prevented if the hazard responsible for the fire had been properly safeguarded. Thirty-one per cent were caused by acts of human carelessness. Fifty-five per cent of the fires of known cause fall into what is commonly known as "special hazards" while thirty-eight per cent originated from "common hazard" causes. Seven per cent of the fires of known cause were of incendiary or suspicious origin.

*See 1950 NFPA Standards for Retail Lumber and Lumber Storage Yards (No. 47-P).

United States and Canadian Large Loss Fires By Occupancy Classification

*Indicates "group" fire (spread to other structures).
†Indicates business interruption insurance loss payments.

MANUFACTURING

Brick, Tile and Pipe Plants

Jan. 2, near Mexico, Mo. Mexico Refractories Co. $407,000.

Fire brick and patch cement. Acetylene gas leaking from a supply hose was ignited by the flame from a torch being used by an employee. The ensuing flash fire burned the employee, who dropped the torch and sought first aid treatment. The burning torch ignited combustible shelves and partitions. The fire department was summoned after attempts by other employees to extinguish the blaze failed.

Nov. 18, Clay City, Wash. Clay City Brick Plant. $467,000.

Brick and tile manufacturing. Fire originating at an electric motor in a wood-lined shaft tunnel destroyed the unsprinklered 60,000 sq. ft. 1-story wooden building. The plant was located in an area without public fire protection. A new and improved water supply to inside standpipes had just been completed four hours prior to the fire but three minutes after fire was discovered the supply main, which had been exposed to the fire in the tunnel, broke, depriving all standpipe lines of water.

Nov. 23, Santa Fe Springs, Calif. Pacific Clay Products Co. $775,000. 1 killed.

Sewer tile. A defective electric fan used for circulating air at 650° F. ignited the roof of the 1,300-ft.-long, 455,000 sq. ft. 1-story wooden drying building. Flames spread rapidly through the undivided, dried-out building and had collapsed the roof before apparatus arrived. The building will be replaced by a fire-resistive structure protected by automatic sprinklers. Overexertion caused the death of one fireman.

Chemical Plants

Jan. 19, No. Brunswick Twp., N. J. E. R. Squibb & Sons. $435,000.† 1 killed.

Penicillin and sulfathiazole. An employee was killed in fire that originated at a neutralization kettle and flashed through solvent vapors on the second floor of the 3-story noncombustible building. Mechanical ventilation was not provided to remove flammable vapors. Seventy-five sprinklers put out all fire except that involving a combustible record cabinet which was extinguished by a 2½-inch hose stream. A static spark or heat liberated by the neutralization reaction was a possible ignition source.

International

Lack of subdivisions permitted total destruction of this building at the Pacific Clay Products plant, Santa Fe Springs, Calif., Nov. 23.

Burning grease defied extinguishment by sprinklers and hose streams, St. Bernard, Ohio, Feb. 20.

Feb. 20, St. Bernard, Ohio. Emery Industries, Inc. $400,000.†

Fatty acid chemical processing. "Acid boil" house. An oxyacetylene torch being used to melt solidified tallow on a 2-inch pipeline ignited grease on the basement ceiling of the sprinklered 1-story brick, wood-joisted building. Flames spread through the grease-covered basement as employees fought the fire for 12 minutes before calling the fire department. Sprinklers and hose streams were apparently holding the fire in check, but after two hours it was necessary to shut off sprinklers and divert hose streams to exposures to prevent water from overflowing the basement and floating burning grease to exposures. Foam was then applied with apparent success until the foam blanket was ruptured and a billow of flame engulfed the building. Several minutes later the floor and roof collapsed, igniting grease in large concrete tanks located at various levels in the building. The destruction of the building was inevitable but firemen successfully protected exposures, including several large storage tanks.

May 12, Bridgeville, Pa. American Cyanamid Co. $300,000.†

Phthalic anhydride. Three explosions within a few seconds of each other caused extensive damage to the roof and windows of the high 1-story noncombustible building, and varying degrees of damage to condensers and fume towers. Although sprinkler piping was broken by the explosion, impairment of protection was not a major factor since most of the ensuing fire was within equipment. The initial moderate explosion is believed to have involved phthalic anhydride vapors in a melt tank. The subsequent more violent explosions are attributed to ignition of combustible dust (probably phthalic anhydride) on building surfaces and in condensers, dispersed by the first blast. Hose streams were rapidly placed in service by plant personnel and by five public companies which were summoned promptly by telephone. Water pressures were reduced by leakage from explosion damaged sprinkler piping.

Distillery

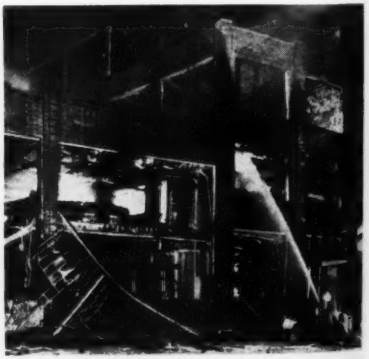
Aug. 15, Amherstburg, Ont. Calvert Distillers (Canada) Ltd. $775,000.

Fermenting and distilling. A violent explosion at 8:25 P.M., followed a few seconds later by an equally violent explosion, blew out sash in all four walls of the 100 by 120 ft. 4-story brick, steel-framed building and wrecked sprinkler piping. Fire immediately filled the upper part of the building. Windows in other buildings were broken and the lower section of one wall of the metalclad rack warehouse 78 ft. distant was bulged by the resulting vacuum. Cause of the explosion is unknown but may have been due to ignition of hot alcohol vapor discharged inside the building from a vacuum breaker on a steamheated still, the only equipment in operation at the time. The still operator, the only building occupant, had shut off the steam and left the building temporarily 25 minutes before the explosion.

Fertilizer Plants

***May 27, St. Bernard, Ohio. Virginia Carolina Chemical Co. $555,000.**

Phosphate fertilizer. Spontaneous ignition of pulverized tobacco stored moist in an open



Wide World

An explosion of flammable vapors wrecked this building at Amherstburg, Ont., Aug. 15.

Acme

Spontaneous ignition of pulverized tobacco stored moist was the cause of fire that destroyed this St. Bernard, Ohio, fertilizer plant May 27. Report page 196.

wooden bin caused fire that destroyed the 97,000 sq. ft. unsprinklered and undivided 32-ft. high 1-story wood-frame, metalclad building. While outside, the plant engineer observed smoke coming from the building and on investigation found a glowing spot six inches in diameter in the bin. His alarm over a private alarm box in another building and the alarm from the central station supervised pneumatic type detection system were received at about the same time, 5:47 A.M. Firemen entered the building but before hose could be charged, fire flashed through the dusty building.

***Nov. 26, Moultrie, Ga. C. O. Smith Guano Co., et al. $1,675,000.†**

Acidulating mill, dry mix building, cotton warehouse destroyed; 5 small buildings damaged. Fire that was beyond control when discovered by an outsider at 2:30 P.M. destroyed the 50,000 sq. ft. unsprinklered 1-story wooden acidulating mill, spread to and destroyed the 30,000 sq. ft. sprinklered 1-story wooden dry mix building 60 ft. away, then jumped 50 ft. to destroy 4,249 bales of cotton in a sprinklered 6-section, 1-story wooden warehouse. Sparks carried by a 20 mph wind ignited two 1-story buildings 650 and 700 ft. from the building of origin and three dwellings 400 ft. farther away. Six fire departments using 10 hose streams finally brought the fires under control. Ineffectiveness of sprinklers in exposed buildings supplied by the public main was probably due in part to use of multiple hose streams at the building of origin.

Dec. 20, Charleston, S. C. Etiwan Fertilizer Co. $550,000.† 1 killed.

Fertilizer mixing and storage. A plant official blamed defective wiring for fire that destroyed the unsprinklered 50,000 sq. ft. 1-story wood-frame, metalclad structure and 28 loaded freight cars. Seven thousand tons of sodium nitrate as well as unknown amounts of various Class A fertilizer materials were in the building at the time of the fire. First aid equipment and private hose streams were used by employees, but fire had involved the entire structure within 10 minutes. Several explosions (possibly caused by contact of water with molten sodium nitrate) occurred during the fire but were not a factor in its spread. The plant superintendent suffered a fatal heart attack during the fire.

Food Products Plants

Jan. 7, Anaheim, Calif. Granada Packing House. $250,000.

Orange packing. A 31-minute delay by the watchman in transmitting the alarm permitted fire to spread beyond control in the unsprinklered 1-story stuccoclad 11,400 sq. ft. building before apparatus arrived. On discovering

Acme

Incendiarism is the reported probable cause of this fire at Goleta, Calif., Jan. 27.

the office heater on fire, the watchman went on foot to notify the police seven blocks away and was so excited that several minutes were required to apprise police of the fire.

Jan. 13, Rutland, B. C. Kelowna Growers Exchange. $427,000.

Apple packing and cold storage; 150,000 boxes of apples. Combustible construction without separating fire walls, −25° temperatures, deep snow, high winds and lack of water prevented firemen from saving any part of the 3-section 1- and 4-story wooden buildings. When discovered at 2:30 A.M., by the watchman fire was spreading through insulating shavings within the walls of the cold storage section. The Rutland pumper froze on the way to the fire, the plant's yard system was frozen, and non-standard hydrant threads prevented the Kelowna engine from connecting to a neighboring plant's yard system.

Jan. 27, Goleta, Calif. Goleta Lemon Assoc. $553,000.

Lemon packing. Based upon the watchman's report and the extent of fire when apparatus arrived, fire officials are of the opinion the fire that destroyed the unsprinklered 50 ft. by 600 ft. 3-story wooden building had been set. According to the watchman the fire was discovered at 7:15 P.M. immediately after a man was seen running from the building. The first and third floors, part of the roof, and the stairways were in flames when apparatus responded, following a delay of several minutes due to the watchman's ignorance of the proper method of transmitting an alarm.

Mar. 8, Phoenixville, Pa. Mrs. Hubbell's Bakeries, Inc. $285,000.

Sandwich crackers. This 1- and 2-story concrete block, wood-joisted building was destroyed because no important steps had been taken to protect it against outbreak of fire, such as installation of sprinklers and provision of watchman service. When discovered by a passing motorist at 2:30 A.M., fire that originated in the first floor icing department was beyond control.

April 4, Waxahachie, Texas. Southern Cotton Oil Co., et al. $257,500.

Feed mixing and storage. Gas leaking from a meter outside the 1-story wood-frame, metal-clad building was ignited when a workman reporting for duty lit a match. Fire outside the building was put out with a hand extinguisher, but unknown to the workman, flames entered the building through cracks in the metal siding and ignited corn husks. Fire punctuated by dust explosions flashed through the long dusty building, involving and destroying all except one-quarter of the structure separated by a brick wall.

***June 11, Fresno, Calif. Ice Sickle Zero Storage Inc., et al. $660,000.**

Berry processing and cold storage. Three adjoining 1-story structures — 900 sq. ft. aluminumclad compressor room, 12,375 sq. ft. aluminumclad processing building and a 10,500 sq. ft. brick, wood-joisted cold storage building — were destroyed by fire that broke out following rupture of a cylinder head on the ammonia compressor. Large quantities of ammonia were released followed almost at once by an intense

Wide World

Watchman failures were important factors in the destruction of this fruit processing plant at Winter Haven, Fla., June 16.

fire that flashed through the compressor and processing buildings. Although a firewall protected the cold storage building, flames spread to the wood roof which collapsed on piles of frozen food. The fire is attributed to ignition of the escaping ammonia.

***June 16, Winter Haven, Fla. Polk Packing Co. $2,075,000.**

Citrus fruit products, fresh-packed fruit, fruit juice, etc. Two boys passing by discovered fire in the coloring room of the 1-story, 188,900 sq. ft. wood-frame, metal-clad building and notified the watchman, who was eating his lunch in a separate building. After failing to extinguish the blaze with standpipe hose the watchman summoned firemen at 11:35 P.M. Ample water was supplied by the plant electric fire pump until the wires were cut as a safety precaution. Efforts to start the auxiliary gasoline-driven deepwell pump proved futile and firemen were forced to move pumpers to the city mains 1,500 ft. away. Flames destroyed the building and severely damaged two combustible structures.

June 22, Rockville, N. Y. Coca-Cola Bottling Co. of New York, Inc. $275,000.

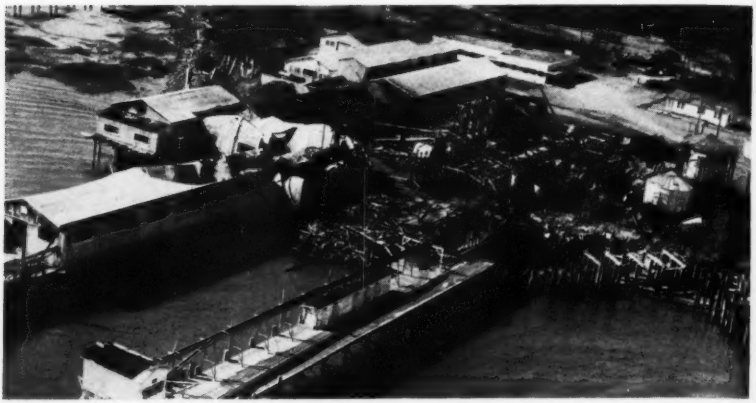
Manufacture, storage and distribution of soft drinks. During fueling of a delivery truck inside the unsprinklered 1-story brick building spilled gasoline ignited. The discharge nozzle had been replaced on the hook but the pump was not shut off. When flames burned off the dispensing hose, additional gasoline was discharged on the floor, causing an intense fire. Failure to close non-automatic fire doors permitted spread to two communicating sections.

***July 2, Humboldt, Tenn. L & N RR. Fruit Packing Shed, et al. $500,000.**

Fruit packing shed, grocery store, barber shop, cafe, furniture store, dry goods store, 5 refrigerator cars, water tower. Believed caused by a carelessly discarded match or cigarette in a pile of straw sweepings, flames aided by exploding barrels of waxing compound spread rapidly over the creosoted timbers of the 1-story wood packing shed. Radiant heat ignited mercantile buildings near by as well as a 35,000-gal. water tank. Combustible construction, inadequate separation and lack of automatic sprinklers were major factors in the rapid spread.

***July 22, Warrenton, Ore. Del Mar Canning Co. $400,000.**

Fish processing, canning, cold storage, scrap reduction; 3 trucks. The 1-story combustible scrap reduction building was destroyed by fire that originated in the vicinity of 3 trucks parked in the building. Fire was beyond control when discovered by an outsider at 8:26 P.M. and was carried by a stiff wind into the cannery and cold storage building before being controlled. No watchman or sprinkler protection was provided. Fish meal dust and fish oil contributed to flame spread. Although unlimited water was available from the Columbia River, fire fighting was severely handicapped by an inadequate supply since apparatus could not be located on an abandoned ice-damaged pier to take suction.



Oregon State Fire Marshal

Fire was beyond control when discovered in this fish processing plant at Warrenton, Ore., July 22. No private protection was provided. See report, page 199.

Aug. 10, Hialeah, Fla. R. H. Hammond Milling Co. $250,000.

Processing cereal food products. Fire that originated in a grain storage bin from an unknown cause was discovered by the watchman at 10:30 P.M. Flames spread through unprotected openings to other sections of the high 1-story masonry and wood mill, but firemen saved the adjoining warehouse using water from a fire well 2,000 ft. from the fire.

***Sept. 16, Pomeroy, Wash. Pomeroy Whse. and Feed Co. $394,500.**

Feed mill, grain warehouse, 3 elevators, 200,000 bushels of wheat. When discovered by a passerby at 1:30 A.M. fire that originated in the basement was beyond control in the 50-year-old 2½-story wooden mill. Flames spread to the 1-story brick, wood-joisted seriously exposed storage building and to the head houses of three wood-frame, metalclad elevators before effective use could be made of fire streams. No sprinkler or watchman protection was provided.

***Dec. 3, Belle Glade, Fla. Belle Glade Farmers Coop. et al. $300,000.**

Vegetable packing and pre-cooling plant. During renovation of the 1-and 2-story wood-framed, metalclad structure, workmen discovered fire in a pile of building materials outside the building. Flames spread to the floor of a wooden loading platform and to the building. Firemen responding to an alarm at 2:12 P.M. found the entire structure involved and confined their efforts to protecting exposures with inadequate water from hydrants fed by 6-inch dead end mains. Fire spread to a near-by metalclad building via crates and rubbish in the yard.

***Dec. 18, Fulton, Ky. Browder Milling Co., Inc. $295,000 (less salvage).**

Feed, cornmeal and flour mill. Lack of watchman service or automatic protection allowed fire originating on the first floor to involve the first three stories of the unsprinklered 4-story wooden feed mill before discovery by an outsider at 8:00 P.M. Absence of fire walls permitted flames to spread through unprotected openings to the communicating flour mill. A permanent ladder on the outside of a detached corn elevator allowed firemen to carry hose up the elevator and extinguish fire that had broken out at the bin floor level.

Dec. 27, Rimouski, Que. Province of Quebec. $415,000.

Fish drying, 1,500,000 lbs. of cod. Fire discovered by the watchman at 8:00 A.M. destroyed this 230-ft.-long 3-story wooden building within 2½ hours. Short circuit of an elevator motor was the reported cause. Firemen were hampered by sub-zero temperatures and lack of water. Pumpers could not draft from the St. Lawrence River because of the low tide and water mains to the plant were shut off during the winter.

***Dec. 29, Yonge's Island, S. C. Atlantic Coast Line Railway. $400,000.**

Cabbage and potato processing. A wharf, railroad depot and processing building comprising the largest vegetable shipping center in the state were destroyed by fire that spread unhindered through the wooden structures. The only fire fighting was by a bucket brigade and firemen from St. Andrew's Parish 20 miles away.

Fur Working

Nov. 15, Norwalk, Conn. Lockwood Fur Co. $700,000.

Hatters furs from rabbit skins and fur scrap. A spark from a fur grinder was the probable cause of fire that originated in a sprinklered, metal-lined exhaust bin on first floor of the sprinklered 3-story wooden building. On hearing the alarm operated by sprinklers in the bin and smelling smoke at 3:45 A.M., the watchman looked around for fire and on failing to locate it shut off the sectional valve. At 4:30 A.M. the plant day fireman arrived and soon discovered flames coming from a wall opening near the ceiling of the boiler room. It is believed that heat from the smoldering bin fire had caused fire to break out in the adjacent concealed wall space through which it spread to the roof. Sprinklers in other parts of the building were ineffective since during the early stages flames were confined to wall spaces and the roof.

Leather Working

Feb. 24, Pasadena, Calif. Joyce Shoes, Inc. $655,000.

Shoe factory. A public fire alarm box operated by a passerby at 7:50 P.M. preceded the watchman's alarm over a private fire alarm box for fire that originated in a 1-story machine shop section. Welding that had been conducted during the day in the vicinity of the roof joists was the probable cause. The machine shop was totally involved when firemen arrived and flames were spreading to other parts of the 1- and 2-story unsprinklered buildings through unprotected openings or protected openings wtih fire doors inoperative because of obstructions.

Wide World

Unprotected openings and blocked fire doors permitted fire to destroy all sections of this shoe factory at Pasadena, Calif., Feb. 24.

May 9, Beverly, Mass. T. A. O'Keefe Leather Co. $300,000.

Sheepskin tanning. Originating in an unsprinklered spraying machine, fire flashed through flammable vapors on the second floor and spread by means of holes in the ceiling and via windows to the third story of the sprinklered 4-story brick, wood-joisted building. Source of vapors is unknown. Although employees had been engaged in removing an approximately 5/8-inch-thick lacquer residue from the machine, they deny using a flammable solvent. Sixty-two sprinklers on the second and 76 on the third floor operated to control the fire until they were shut off by the fire department 36 minutes after the fire originated. Eleven hose streams were used to complete extinguishment.

Linseed Oil

Nov. 29, Minneapolis, Minn. Archer-Daniels-Midland Co. $375,000.†

Flax cleaning. Foreign material in flax being cleaned in a machine on the first floor was the probable cause of a dust explosion at 2:15 P.M. that blew out a 25-ft. section from each of two walls of the wood-frame, metalclad elevator. Sprinklers held the ensuing fire in check in sprinklered areas but water could not reach hidden fires in unsprinklered bins, cleaning machinery and grain handling equipment. At 3:00 P.M. firemen apparently had fire under control and at 4:30 P.M. ordered sprinklers shut off. At 6:00 P.M. the hidden fires increased in intensity and at 6:20 P.M. a violent explosion occurred on the upper floors. Sprinklers were again turned on but due to broken piping were of no value on the fire that was now raging throughout the structure. At 11:45 A.M. Nov. 30 the building collapsed.

Metalworking

***Jan. 31, St. Louis, Mo. Mesher Bros. Iron Foundry. $250,000.**

Foundry. A watchman in a near-by building saw fire in the 3-story brick, wood-joisted structure at 8:34 P.M. The delayed detection and exploding drums of lacquer allowed flames to gain terrific headway before firemen arrived. Fire spread to a communicating office building by means of an open passageway on the second floor. Cause of the blaze is undetermined.

Delayed detection and exploding drums of lacquer allowed fire to gain terrific headway in this St. Louis, Mo., foundry before firemen arrived in response to an outsider's alarm. See report, page 201.

Feb. 11, New Haven (Annex), Conn. American Steel & Wire Co. $300,000.

Wire galvanizing. Oil released under 40 lbs. pressure from a ruptured fuel bin to an oil-fired furnace ignited and sprayed the underside of the wood roof of the high 1-story brick, wood-joisted building. Sprinklers operating in the fire area could not control the fire in the roof and when the roof sagged, snapping a riser, sprinklers in other areas to which the fire spread were deprived of water until the steam fire pump could be started. Fire damage was confined primarily to the roof of the 300-ft.-long structure.

Feb. 20, Pittston, Pa. Pittston Stove Foundry. $353,000.

Iron stoves and parts. Discovered by maintenance employees at 3:40 P.M., fire that originated near a cupola on the first floor had involved all parts of the foundry section when apparatus arrived. A fire wall with all openings protected prevented flames from spreading to the adjoining and communicating pattern shop in the unsprinklered 3-story brick, plank and timber building.

Feb. 20, Belvidere, Ill. National Sewing Machine Co. $311,500.

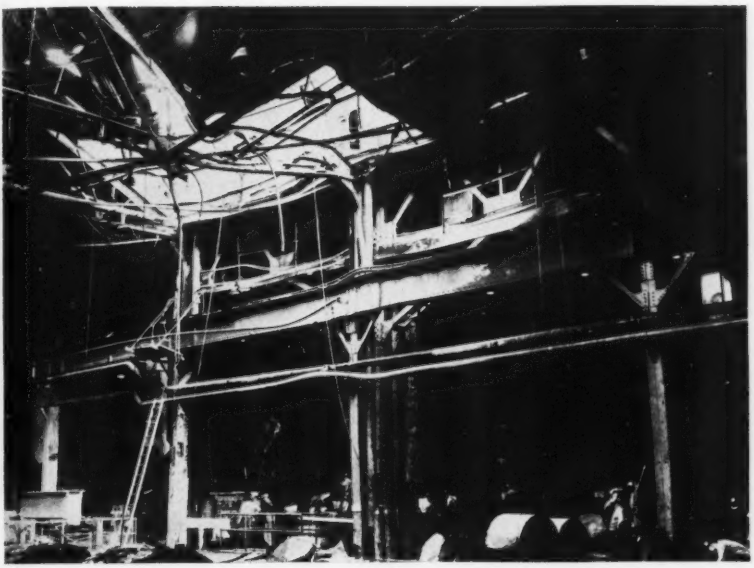
Foundry. Smoke was seen coming from a roof monitor at 8:00 A.M. by employees who tried to extinguish the fire with small hose streams and first aid extinguishers, causing a delay in alarm of 20 minutes. Flames spread rapidly and destroyed most of the high 1-story brick, steel-framed structure before firemen brought them under control.

Mar. 10, Etna, Pa. The National Supply Co. $600,000.

Pipe manufacturing. Sparks from a pipe-cutting saw ignited flammable rust-proofing oil on the floor and on racks of pipe in an adjoining area. Intense heat ignited the underside of the asphalt-coated metal roofing of the large-area unsprinklered 1-story, steel-framed building. Employees used foam extinguishers but without effect as asphalt dropping from the spreading fire started other fires well removed from the original blaze. Approximately 150,000 sq. ft. of roofing was damaged.

Mar. 28, Pueblo, Colo. Triplex Corp. of America, et al. $450,000.

Aluminum foundry. Flammable hydraulic fluid released from a broken 1/8-inch hydraulic tube or fitting on a molding machine sprayed on an electrically heated aluminum holding pot and ignited. The fluid under 300 psi and supplied by a 65-gal. tank continued to spray the



Weirton Steel Co.

Fire caused by ignition of flammable hydraulic fluid released from a broken hydraulic line ignited the asphalt-coated metal roof. Flames spread rapidly along the under and upper surface of the roof. Drops of flaming asphalt caused extensive damage to contents of this metal working plant at Weirton, W. Va., May 2.

ceiling and most of the interior of the 30,000 sq. ft. wooden building (formerly an army base building). The Air Base Fire Department delayed notification of the city department 16 minutes.

***Apr. 27, Malta, Ohio. Brown-Manly Plow Co., et al. $283,500.†**

Agricultural implements, mostly hand propelled; 3 dwellings, town hall. At 1:40 P.M. an employee outside saw flames coming from windows of an unused storeroom on the second floor of the unsprinklered 3-story wooden building. Flames and smoke spread through the undivided structure so rapidly that many of the 215 employees had to jump from windows. Two 20-barrel paint dip tanks intensified the fire. Loss of patterns was of major importance since no drawings were used. Before being controlled, flames destroyed a 2-story wooden warehouse, 3 dwellings and the town hall, all within 50 ft. of the building of origin. Firemen from 12 towns assisted the Malta Department.

May 2, Weirton, W. Va. National Steel Corp. $925,000.†

Steel tinning by electrolytic process. Approximately 250,000 sq. ft. of asphalt coated metal roofing of the unsprinklered 1-story building was damaged by fire caused by ignition of flammable hydraulic fluid released at 750 psi from a broken hydraulic line. The fire made the emergency valve inaccessible, preventing prompt shut off of oil. The roofing was ignited by heat from the oil fire and flames spread rapidly along the under and upper surfaces. Drops of flaming asphalt caused extensive damage to contents and prevented firemen from reaching the base of the fire. The plant fire department sent in a general alarm calling equipment from Weirton and from other communities.

May 8, Chicago Heights, Ill. Benjamin Harris & Co. $707,500.†

Brass foundry. Sparks from a furnace were the probable cause of fire which originated on the roof of the high 1-story brick, wood-joisted building. Firemen were unable to cope with the fire due to weak public water supplies. At the time of the fire plans were under consideration, and steps are now being taken, to lay additional mains and improve the water supply for fire fighting.

Sun-Times

The watchman reporting for duty twenty minutes after the last employee had left for the night found fire in this foundry at Owen Sound, Ont., May 12.

May 8, Marion, Ohio. Storm Windows of Aluminum, Inc. $621,000.†

Aluminum storm doors and windows. No cause has been determined for fire that destroyed this unsprinklered 2-story masonry, wood-joisted building. A passing motorist and the two plant watchmen discovered the fire at 12:54 A.M., at which time the roof was ablaze. The watchmen had just completed their rounds when smoke was detected.

***May 12, Owen Sound, Ont. Wm. Kennedy & Sons, Ltd. $593,500.**

Steel, iron and bronze foundry (machinery for heavy industry); four dwellings, one store. Twenty minutes after the last employee left, the watchman reporting for duty found the unsprinklered 40-ft. high 1-story brick, wood-joisted machine shop charged with smoke from a fire that originated in the bronze room. Before apparatus arrived flames spread rapidly beneath the roof to all parts of the 30,000 sq. ft. building and jumped to dwellings 4 ft. away.

June 9, Marion Twp., Ohio. S. A. Shenk & Co. $375,000.†

Auto parts reclaiming and engine rebuilding. Watchman protection for the yard around the building only, permitted fire to make great headway within the unsprinklered and undivided 27,500 sq. ft. masonry, wood-joisted structure before the watchman noticed smoke coming from a ventilator at 6:42 P.M.

***June 12, Chicago, Ill. Superior Sleepright Corp. $672,000.**

Metal springs, cotton matting. Fire that occurred in an inadequate protected tank at 2:15 P.M. spread beyond control of sprinklers and hose streams when an explosion occurred, forcing firemen to leave the 2-story, wood-joisted building. Flames spread through unprotected vertical openings and involved the entire structure. 490 sprinklers fused. Fifty bales of excelsior and the contents of three dip tanks added to the intensity of the blaze. Exposures were threatened throughout the fire. One example was the ignition of 500 bales of paper stored adjacent to a sprinklered 3-story building 400 ft. from the original fire. Fire from the burning paper was prevented from entering windows by fire department hose streams and the operation of sprinklers.

July 14, Greenville, Ohio. The Treaty Co. $845,000.†

Cast iron plumbing supplies and street fittings. Fire originating in the unsprinklered 33,548 sq. ft. 1-story foundry section was discovered by an outsider at 2:00 A.M. Flames spread rapidly beneath and above the combustible roof and entered the adjoining 2-story section through windows on the second story overlooking the roof, and through unprotected openings in the division wall on the first floor.

Wide World

This fire on June 12 in a sprinklered Chicago factory originated in a dip tank. Fifty bales of excelsior and the contents of the three dip tanks added to the intensity of the fire. The fire emphasized the need for adequate automatic protection for dip tanks in sprinklered properties, segregation of hazardous processes, enclosures at vertical openings and subdivision of fire areas by fire walls. See report, page 204.

When discovered by an outsider at 2:00 A.M. July 14 fire was beyond control in a 1-story section of this metal plant at Greenville, Ohio. Flames entered the 2-story section (visible above) through windows on the second story overlooking the roof of the 1-story section, and through unprotected openings in the division wall on the first floor.

July 29, High Bridge, N. J. Taylor-Wharton Iron & Steel Co. $250,000.

Foundry. Faulty burner operation on an oil-fired oven for drying molds was the reported cause of an oil fire on the floor outside the oven. Melting of an aluminum cap on the oil pressure regulator released oil under 55 psi into the fire area. Flames jumped to the asphalt coated metal roof and spread along the under surface of the roof to all parts of the unsprinklered 1-story 50 ft. by 400 ft. building.

Oct. 27, Battle Creek Twp., Mich. Eaton Mfg. Co., et al. $750,000.

Jet blades for turbine engines. Rupture of the rubber hose on a hydraulic line carrying hydraulic fluid (flash point 440° F.) at 400 psi allowed the liquid to spray over hot stock and a furnace. The plant fire brigade fought the fire for 13 minutes before calling for aid from the public fire department. Although a large part of the roof had collapsed before public apparatus arrived, the combined efforts of the private and public fire departments confined damage to 30,000 sq. ft. of the 45,000 sq. ft. unsprinklered 1-story section. Operation of 160 sprinklers in the adjoining 2-story section prevented spread to that area.

Nov. 30, near St. Paul, Minn. Pufahl Foundry, Inc. $375,000.†

Grey iron foundry. Spillage of molten metal against a wood partition is the probable cause of fire discovered by a maintenance employee at 5:25 P.M., shortly after the foundry had closed for the day. Oil that had vaporized from cores and molding sand and had accumulated on the under surface of the wood roof hastened flame spread through the undivided and unsprinklered 1-story concrete block, wood-joisted building.

Mining Properties

***June 14, near Nordegg, Alta. Brazeau Collieries. $1,000,000.**

Briquette plant, tipple, storage bins, coal dust bins. An overheated fan bearing was a possible cause of fire that originated in a wooden shed attached to a dutch oven in the unsprinklered 1-story brick and metalclad briquette plant. When discovered by the watchman at 4:30 A.M. only smoke was visible, but flames burst forth when a small hose stream was directed into the shed. Flames raced through clouds of coal dust raised by two light dust explosions and had involved the building of origin before two yard hydrant streams could be operated by night shift employees. There was no public fire protection.

Oct. 7, near Clarksburg, W. Va. The Barns Coal Co. $470,000.†

Bituminous coal loading tipple. Sparks from an acetylene cutting torch being used by a contractor's employee remodelling the tipple ignited grease and coal dust on a steel car loading boom. Flames spread quickly up the boom and into the 2-story wood-frame, metalclad tipple. Inadequate water, and the time required for firemen to respond from Clarksburg and Shinnston prevented their saving the structure.

Dec. 22, Keewatin, Minn. Hanna Ore Co. $250,000.

Truck repair shop. The unsprinklered 140 ft. by 80 ft. steel framed, metalclad quonset type building, lined with combustible fibreboard, was destroyed by fire discovered in the electrical repair shop by employees. The one hose stream used was ineffective since the windowless metal walls prevented water from reaching the inside. Flames spread quickly through the combustible interior, causing steel supports to give way and the entire structure to collapse.

Multiple Occupancy

***Nov. 27, New York, N. Y. Handles, Inc., et al. $500,000.**

Four buildings housing various small manufacturing occupancies. Ignition of cellulose nitrate plastic handles for women's handbags by an overheated drilling machine on the fourth floor was the cause of fire that destroyed the un-

Acme

Fire at New York, Nov. 27.

Charles Studio

Another delayed detection fire, this one at New Richmond, Wisc., Sept. 16.

sprinklered 5-story brick, wood-joisted building and damaged three adjoining buildings. Four employees on the upper two floors were burned while fleeing the flash fire.

Nov. 11, Amesbury, Mass. R. & G. Mfg. Co., et al. $400,000.

Metal cabinet manufacturing, furniture storage, bowling alley. Thirty minutes after a truck had been loaded with metal cabinets, fire was discovered by an outsider at the loading platform. First arriving firemen found flames spreading up the adjacent elevator shaft. Although all door openings in the shaft were protected by fire doors, evidence indicates that those at the platform entrance and at certain floor levels were open, permitting flames to spread laterally from the shaft into the unsprinklered 5-story brick, wood-joisted building.

Paper Products Plant

May 2, near Miami, Fla. Miami Paper Board Mills, Inc. $280,000.

Paperboard. Believed caused by sparks from a welding operation, fire was first noticed in accumulations of paper dust around an exhaust duct near the roof. Flames spread rapidly across the undersurface of the asphalt protected metal roof. After attempts by employees to extinguish the blaze were unsuccessful, the fire department was called at 6:30 P.M. When the flames were finally brought under control, the entire interior of the 1-story masonry building was destroyed. Firemen were hampered by the lack of adequate static water supplies.

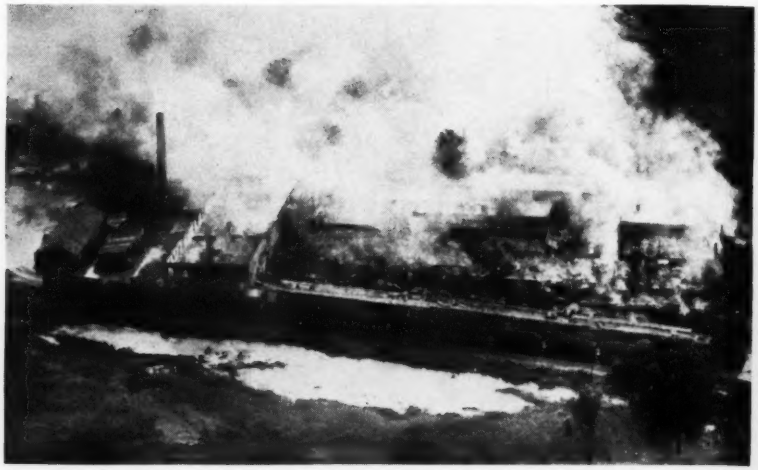
Plastic Fabricating

May 26, near Newport, Ark. Victor Metal Products. $257,000.†

Plastic tube and bottle caps. Fire originated in a concealed space between the fibreboard ceiling and the roof from an unknown cause in the 1-story, wood-frame, asbestos clad section. Occupants were unaware of the fire which was first discovered by an outsider at 6:30 P.M. One truck and a driver responded to the alarm. Employees using the pumper to boost the low hydrant pressure fought the blaze with two 2½-inch hose lines until apparatus arrived from Newport and put two more lines in operation. Fire was confined to the section of origin, but production of the entire plant was impaired by the loss.

Sept. 16, New Richmond, Wisc. Doughboy Industries, Inc. $303,000.

Plastic toys. When discovered by an outsider at 4:45 A.M., fire was beyond control in the 1-story brick, wood-joisted building. No watchman or automatic protection was provided. Firemen responding with a pumper from neighboring Hudson were unable to connect to a hydrant because of non-standard threads on the Hudson hose and lack of an adaptor.



Acme

Water was responsible for this fire at Crooksville, Ohio, June 16.

Potteries

Mar. 16, Roseville, Ohio. The Nelson McCoy Pottery Co. $500,000.†

Art and utility ware. When discovered at 11:45 P.M. by the watchman, fire that originated in the casting room on the third floor of the unsprinklered 3-story brick, wood-joisted building had involved the entire roof. Flames spread down through open stair and elevator shafts to lower floors. Fire walls with protected openings were credited with preventing spread to other adjoining 1-story sections.

June 16, Crooksville, Ohio. A. E. Hull Pottery Co. $580,000.

White clay kitchen and art ware. A flash flood entered the building and cracked the wall and roof of a kiln which had recently been operating at 2300° F. Released heat ignited the wood roof of the unsprinklered 64,569 sq. ft., brick, wood-joisted building. Fire apparatus responded but due to flood waters 4½ to 5 ft. deep around the building, could not get within range. Although a watchman made hourly rounds of the building, neighbors were the first to discover the fire at 11:30 P.M.

Rubber Working

Feb. 16, Midland, Mich. The Dow Chemical Co. $1,131,000.† 8 killed.

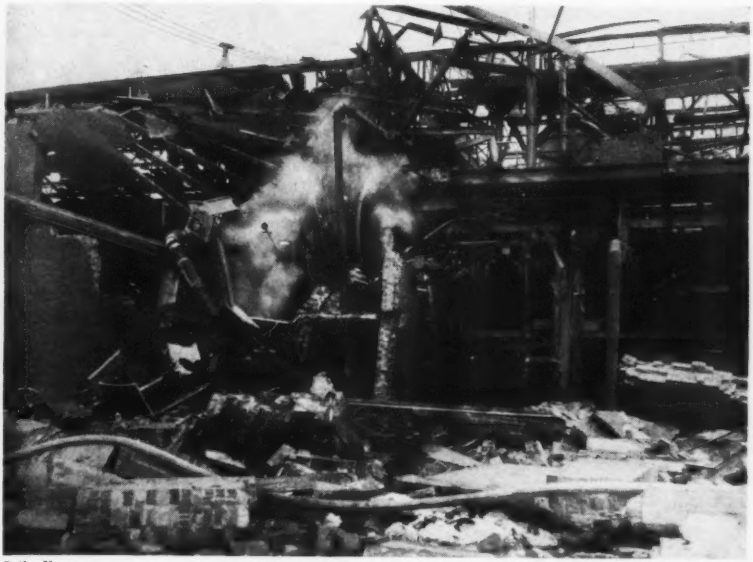
Water emulsion latex. Explosion of vapors accidentally released into the reactor area from latex processing equipment killed eight employees and injured twenty-six. Fire damage was incidental to explosion damage which ruptured supply risers and other sprinkler piping. Explosion-damaged tracks prevented fire doors from closing, permitting fire to spread to two bays of the adjacent packaging section.

***May 13, Indianapolis, Ind. The Richardson Co. $651,000.†**

Rubber grinding and milling. Manufacturing battery boxes. When firemen responded to the watchman's alarm at 4:05 P.M., they discovered the yard hydrants were dry, the 40,000-gal. gravity tank supplying the sprinklers drained, and the fire pump not operating. Flames that originated in the pulverizing section, believed caused by spontaneous ignition of bags of pulverized rubber and lampblack, spread to an adjoining building through the communicating doorway (fire door open). Fire destroyed the 1-story brick, steel-framed building of origin and damaged four others.

Dec. 6, New Milford, N. J. New Milford Rubber Co. $250,000.

Fire hose. This unsprinklered 1-and 2-story wooden building was destroyed by fire that originated at a weaving loom at 2:00 A.M. Delay in notifying the fire department by the two employees in the building until they had first tried to extinguish the blaze with first-aid equipment allowed the fire to spread beyond control before apparatus arrived.



Daily News

Eight employees were killed in an explosion of flammable vapors at this synthetic rubber plant at Midland, Mich., Feb. 16. See report, page 208.

Acme

When firemen responded to this fire at Indianapolis, Ind., May 13, they found the gravity tank supplying sprinklers drained and the fire pump not operating. Fear that the tank would collapse in a high wind was the reason given for its being drained. See report, page 208.

A sprinkler system is of no use without water, as witness this fire at Corinna, Me., March 15.

Stone Working

***May 26, Lithonia, Ga. Stone Mountain Grit Co. $334,500.**

Granite cutting and crushing. Manufacturing grit for chickens. Flames that originated on the fourth floor of the 4-story wood-frame, metalclad structure were through the roof when discovered by an employee at 10:30 P.M. Fire spread rapidly through the dust covered interior of the mill and through conveyor shafts and interconnecting passageways to adjacent 1-, 2-, and 3-story buildings. Lack of adequate water prevented firemen from controlling the blaze until most of the plant was destroyed.

Textile Working

Jan. 28, San Francisco, Calif. Golson & Menzin, et al. $250,000.

Dresses, luggage manufacture, wine storage and sale, offices. Fire originating on the second floor of the 6-story building was not discovered until a rear window blew out at 1:23 P.M., Saturday afternoon. Fire spread up an open elevator shaft, causing minor damage on the third, fourth and fifth floors and extensive damage to the sixth where it mushroomed. Fire also spread to upper floors through plain glass windows in the rear. No sprinkler or watchman protection was provided.

***March 15, Corinna, Me. Moosehead Woolen Mills, Inc. $541,000.†**

Two mills and dwelling. While employees were working on a sprinklered steam heated cloth dryer in the basement of the 2-story wooden building, a hot chip from an electric drill ignited lint in the exhaust duct. Flames driven by the exhaust fans spread through the metal ducts and across the lint-covered ceiling of the basement. Employees attacked the fire with first-aid extinguishers and hose lines from the booster tank on the plant fire truck, but failed to extinguish the flames. Firemen discovered the yard hydrants dry and no water discharging from the sprinkler system indicating that the valve to the 40,000-gal. gravity tank may have been closed. Since the tank and most of the plant was destroyed, there is no concrete evidence to support this theory. A near-by wooden mill and a dwelling, ignited by wind-carried sparks, were destroyed.

July 15, Appleton, Ont. Collie Woolen Mill. $323,000.

Wool cloth finishing. This 4-story stone, wood-joisted mill had no private fire protection and was located in a town without a fire department. When fire broke out during the night, results were therefore as would be expected — total destruction. When discovered by neighbors at 4:50 A.M., fire had control of the building.

Aug. 9, Winnipeg, Man. R. K. Garment Co., Ltd., et al. $400,000.

Six clothing manufacturers on upper floors, auto salesroom on first. Fire originating in a ladies rest room of a third floor tenant had made great headway when discovered by an employee of another tenant at 6:28 P.M. Plywood partitions prevented firemen from reaching the flames with hose streams during the early stages. Fire spread through open non-automatic fire doors and via open stairways to all parts of the three upper floors of the unsprinklered 4-story brick, wood-joisted building.

Sept. 2, Nashville, Tenn. A. L. Kornman Co., Inc. $832,500.†

Men's suits. Fire that originated on the fifth floor of the sprinklered 5-story brick, wood-joisted building destroyed 20,000 men's suits.

Acme

Flammable vapor explosion, Cincinnati, Dec. 9.

Sprinklers operated to give the alarm over the central station supervised waterflow alarm system, and were holding the fire in check on the fifth floor until the weight of water caused the poorly constructed fourth floor ceiling to collapse and rupture sprinkler risers. With the interruption of flow of water to the sprinklers, fire spread out of control in the fifth story. Firemen responding to a central station supervised waterflow alarm confined fire damage to the fourth and fifth floors.

Dec .4, Ladysmith, Wisc. Milwaukee Bedding Co. $325,000.

Jute and sisal filler for automobile seat cushions. Twenty-five carloads of jute and sisal stock fed fire that destroyed all but the walls of this undivided 136 ft. x 206 ft., 1-story masonry, steel-framed building. A homemade sprinkler system "protected" the building. Cause of the fire beyond control when discovered by an outsider at 7:00 P.M. is unknown.

Dec. 9, Cincinnati, Ohio. American Waterproofing Co. $550,000.† 5 killed.

Cloth waterproofing. Four men were killed instantly, one died later and 16 were injured in an explosion of flammable vapors that wrecked the sprinklered 2-story fire-resistive building. A flammable solvent being used to clean machinery is the reported source of the vapors. All safety devices required are reported to have been provided and employees have stated that ventilating fans were in operation.

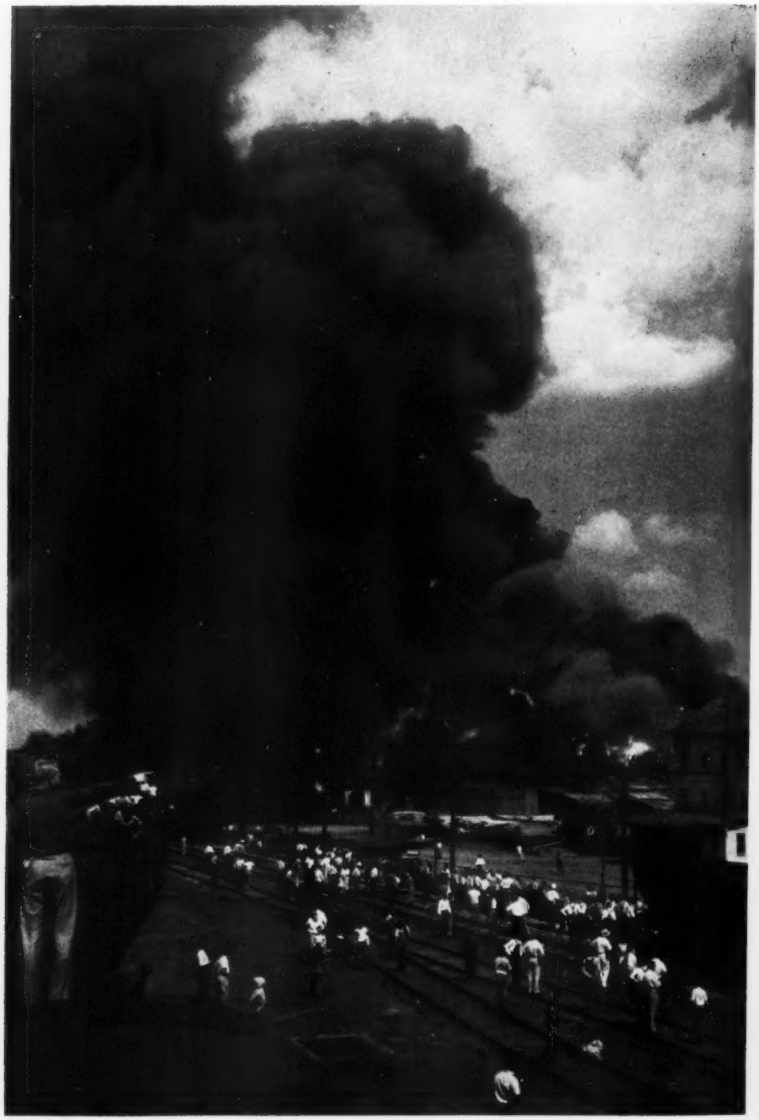
Varnish Mfg.

Sept. 15, No. Kansas City, Mo. Cook Paint and Varnish Co. $300,000.†

An explosion of flammable vapors from a varnish processing kettle maintained at 700° F. destroyed the roof and one wall of the 1-story 50 ft. x 150 ft. masonry and steel building. The ensuing flash fire burned four employees and spread to a communicating building before the automatic fire door operated. The sprinkler system was badly damaged by the explosion and therefore was of little value.

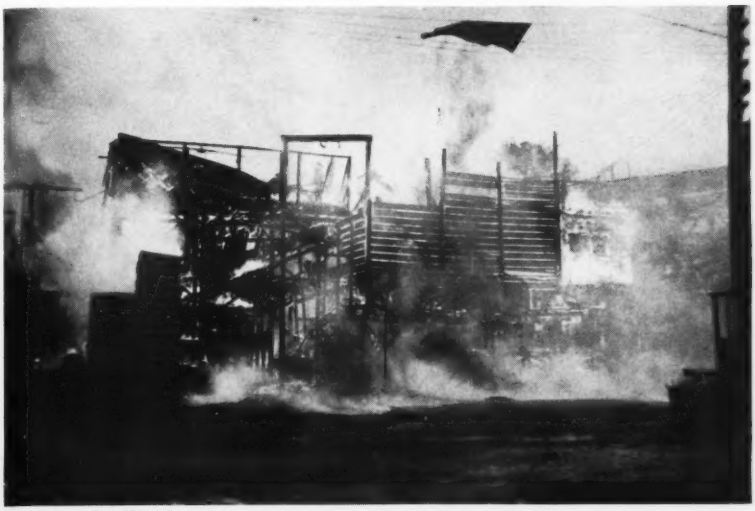
Acme

Cucamonga, Calif., winery fire, Jan. 30. **See report, page 213.**



Ben A. Stimsons Studios

Four unsprinklered closely grouped combustible buildings and more than three million board feet of yard-stored lumber were destroyed by fire that originated near machinery being repaired by a welding torch. The fire occurred at No. Wilkesboro, N. C., April 29. **See report, page 213.**



Oregon State Fire Marshal

Electrical failure at a 250 h.p. slip ring motor caused fire that destroyed this sawmill near Willamina, Ore., June 22. See report, page 215.

Wineries

Jan. 30, Cucamonga, Calif. Cucamonga Pioneer Vineyard Assn. $712,500. 1 killed.

Storage of 1,009,700 gallons of wine in 69 large wooden tanks. The only employee in the 32,000 sq. ft., high 1-story wooden building was trapped and the building and contents destroyed in fire that originated from an unknown cause near a 40,000-gallon tank. Ten minutes delay in detection, 8 minutes delay in alarm transmission as employees from other buildings fought the fire, combustible construction, no subdivisions, exploding tanks of wine, and the inadequacy of 4-inch yard mains were notable factors in the loss.

Feb. 8, Fresno County, Calif. Sunnyside Winery. $390,000.

Sherry wine fortifying and storage. Flames were coming from the roof monitor of the unsprinklered 23,500 sq. ft. adobe walled, wood-roofed building when discovered by neighbors at 1:14 A.M. Cause is unknown but possibly due to ignition of hot wine vapors by electrical equipment which did not comply with provisions of National Electrical Code for hazardous areas. The only ventilation was accomplished by doorways (closed at time of fire) and roof monitors. No watchman was provided, and no fully organized rural fire protection was available. Short circuits caused by the fire kicked out the circuit breaker, thereby shutting down the fire pump supplying yard mains until the breaker was reset by the power company crew.

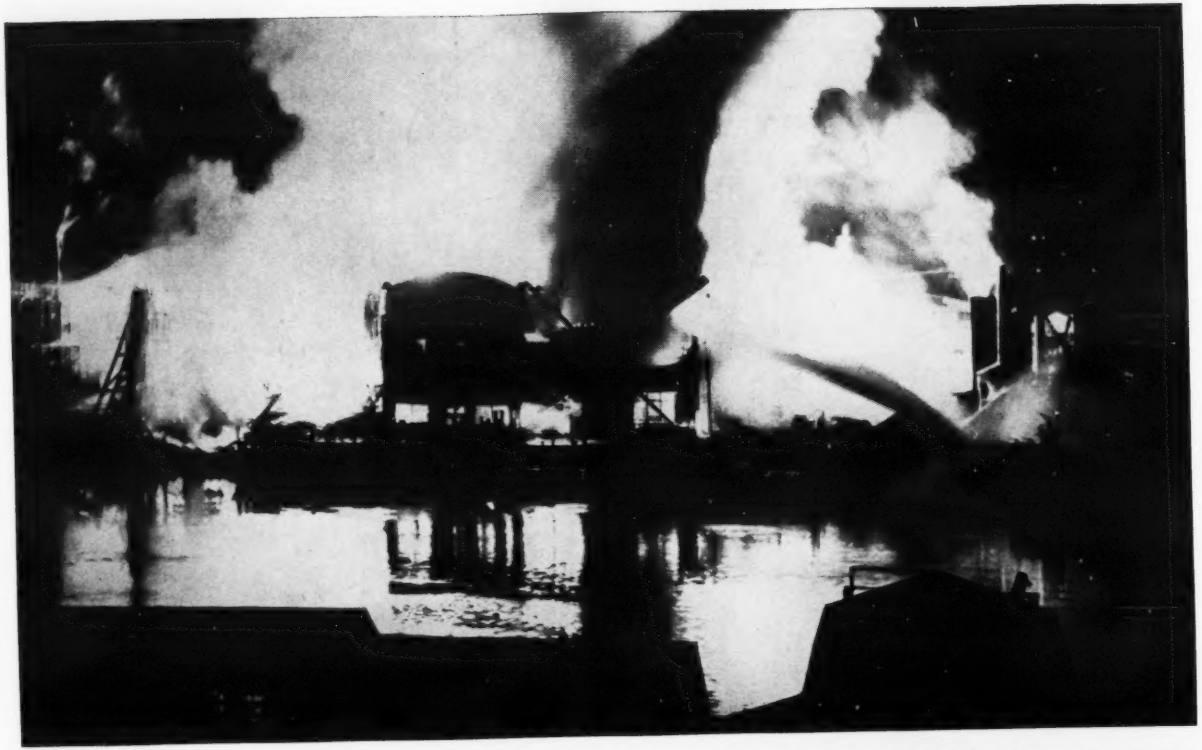
Woodworking, Saw and Planing Mills

***April 29, No. Wilkesboro, N. C. P. E. Brown Lumber Company, et al. $900,000.**

Saw and planing mill, grain mill, truck terminal, ice and fuel company. Four unsprinklered closely grouped 1- and 3-story combustible buildings were destroyed by fire that originated in the woodworking plant near machinery being repaired by a welding torch. Flames flashed through the undivided building, ignited the more than 3 million board feet of yard-stored lumber and spread into three exposed buildings. High winds, inadequate clear spaces between buildings and lumber, and insufficient hydrants near the fire resulted in burn-out of the two block area.

***June 3, Perry, Fla. Lee Tidewater Cypress Co. $552,500.†**

Saw and planing mill, dry kilns, lumber sheds, 12 railway box cars. When discovered by the watchman at 2:40 A.M. fire involved the small log and blower house, but by the time the fire department had been called, flames had spread to the 1-story greenwood planing mill. The combustible construction and contents of the 130,000 sq. ft. building intensified flame



Wide World

This boat building, repair and outfitting works, destroyed by fire at Tacoma, Wash., Aug. 15, was a 50-ft.-high 1-story wooden structure consisting of a single fire area of 70,000 sq. ft. Acetylene escaping from a 1-inch pipe that had been ruptured by an electric arc, burned with a torch-like flame and set fire to the building according to a report submitted by the Tacoma Fire Department. See report, page 216.

Oregon State Fire Marshal

Sawmill fire near Cottage Grove, Ore., Oct. 26.

spread and prompted firemen to protect exposures. Water supply from the yard hydrants was adequate until the roof collapsed and broke standpipes, allowing water to escape.

June 22, near Willamina, Ore. Willamina Lumber Co. $256,500.

Sawmill, green chain, stocking crane. Electrical failure at a 250 h.p. slip ring motor that operated a large band saw caused fire that destroyed the 1- and 2-story wooden mill. Smoke boiled from the motor when the switch was turned on followed by flames that quickly spread beyond control of a carbon dioxide extinguisher and standpipe line used by employees. Dispersion of other mill buildings and a favorable wind prevented their involvement.

***Sept. 8, Bluefield, Va. Seyler Lumber Co. $350,000.**

Two carpenter shops, two storage sheds, one dry kiln and yard-stored lumber. Lack of sprinklers permitted fire to spread beyond control in a 1-story metalclad storage shed despite discovery by the watchman at 1:15 A.M. without serious delay. Inability of sprinklers to save an exposed 3-story brick, wood-joisted carpenter shop is believed due to rupture of the supply main by a falling wall. Firemen were hampered by inadequate water as flames spread to other exposed buildings and lumber piles.

Oct. 26, near Cottage Grove, Ore. Lorane Valley Lumber Co. $415,000.

Sawmill. Fire that apparently originated in an area adjacent to a large switch panel under the mill spread so rapidly through the large wooden structure that two millwrights were forced to run to get out of the building ahead of the flames. Plant employees and firemen, aided by a favorable wind and a torrential downpour, prevented flames from spreading to the remainder of the sprawling plant.

Woodworking, Wood Products

***Feb. 26, Locke Mills, Me. E. L. Tebbetts Spool Co. $250,000.**

Handles, spools, toys. Explosive ignition of wood dust in the 1-story brick, wood-joisted boiler house raised dust in the communicating 1- and 3-story wooden mill that violently exploded. The ensuing fire flashed through the undivided structure opening so many sprinklers that the 5,800-gal. gravity tank was soon exhausted. Heat prevented employees from starting fire pumps, supplying yard mains and sprinklers.

***April 1, Emigsville, Pa. American Acme Co. $600,000.**

Wooden toys and summer furniture. Two connected unsprinklered 1-story brick, wood-joisted buildings, one of them crammed with

This boat building, repair and outfitting works, destroyed by fire at Tacoma, Wash., Aug. 15, was a 50-ft.-high 1-story wooden shed consisting of a single fire area of 70,000 sq. ft. Acetylene escaping from a 1-inch pipe that had been ruptured by an electric arc, burned with a torch-like flame and set fire to the building according to a report submitted by the Tacoma Fire Department. See report, page 216.

Acme

Fire at auto body trim plant, Tilbury, Ont., June 23.

furniture, were destroyed by fire originating in the basement packing room. Discovery was by an outsider at 9:45 P.M.

***May 17, Brewton, Ala. T. R. Miller Mill Co. $760,000.**

Box factory, veneer mill, lumber warehouse. The watchman discovered flames in the pattern room of the 1-story steel framed, metalclad box factory and notified the boiler fireman. The latter blew the plant whistle but by mistake blew the coded signal for accident instead of fire. Firemen were summoned by a policeman. Radiant heat ignited a warehouse 32 ft. away containing 1,250,000 ft. of veneer. Lack of adequate water supply, extent of fire on arrival of apparatus, and the large undivided buildings with combustible contents were factors in the large loss.

June 23, Tilbury, Ont. Chatco Steel Co., Ltd. $411,500.

Auto body trim; truck body stakes. At 3:10 A.M., an hour and ten minutes after the company watchman had checked the building, a small fire was discovered by the night fireman between the main electrical panel and adjacent punching machines in the millroom. The plant siren was blown at once but flames spread so rapidly through wood dust that the unsprinklered and undivided 200 ft. sq. 1-story brick, wood-joisted building was completely involved before yard hydrant streams could be used.

Aug. 15, Tacoma, Wash. Western Boat Building Co. $760,000.

Boat building, repair and outfitting. Acetylene escaping from a 1-inch pipe ruptured by an electric arc burned with a torch like flame and set fire to the wooden building. Despite prompt detection the contents of paint vats in the paint room and approximately 1,200 lbs. of oxygen released when an oxygen line broke helped spread the flames rapidly through the 70,000 sq. ft. undivided building.

***Oct. 13, Braddock, Pa. Swissvale Pattern Co., et al. $307,000.**

Foundry patterns. At 7:10 A.M., approximately two hours after the watchman went home, fire originating on the second floor of the 2-story brick, wood-joisted building was discovered by a passerby. In addition to the substandard watchman protection, lack of sprinklers, fire divisions, and a dust removal system were factors in the rapid destruction. Flames spread to the roof of an adjoining foundry but were prevented from entering by firemen.

Dec. 14, Marine City, Mich. Detroit Gasket and Mfg. Co. $250,000.

Cork gaskets. At 2:06 A.M. the watchman discovered fire in the vicinity of a gas-fired vat containing hot wax. Although the vat was protected by a manually operated carbon dioxide system the fire prevented the watchman from operating the release mechanism. Sprinklers held the fire in check until extinguished by six hose streams. Fire damage was confined to a 9,000 sq. ft. area of the 1-story non-combustible building. Most of the 531 sprinklers that opened were operated by heat that mushroomed into communicating areas.

Total Manufacturing Losses: $42,111,000.
17 killed.

Mercantile

Department Stores

Jan. 14, Dallas, Tex. H. L. Green Co., Inc. $671,500.†

Department store, offices above second floor. Fire originated in the vicinity of an air conditioning system plenum chamber on the second floor of the 8-story fire-resistive building and separated from a very congested stock storage area by a wire fence. Employees fought the fire with soda-acid extinguishers for ten minutes before giving the alarm. When the canvas connection between the plenum chamber and overhead ducts burned, operating blowers fanned the fire through wood shelving loaded with merchandise. Sprinklers were not in operating condition due to alterations to the system still in progress on the first floor. Congested stock and insufficient windows made fire fighting difficult. Fire was confined to the second floor, but water damage to the first story was severe.

Acme

Dallas, Texas, department store fire, Jan. 14.

Feb. 16, Enid, Okla. Newman Mercantile Co. $389,000.†

Department store including furniture. At 3:24 A.M. the watchman, while on the mezzanine floor, noticed the odor of smoke and traced it to its source in a cutoff shipping and receiving room in the basement of the unsprinklered 1-story fire-resistive building. Fire was confined to the 1,250 sq. ft. area of origin, but absence of automatic shut-offs on the air conditioning system fan and absence of automatic dampers in ducts permitted smoke and heat to spread throughout the building.

Mar. 10, Baltimore, Md. Hecht Department Store. $334,500. 2 killed.

Home furnishings. At 8:45 A.M., as employees were assembling for the day's work, fire that originated in the 18-inch deep concealed space above the pressed board basement ceiling was discovered on the ceiling. Before the alarm could be given smoke and flames spread with great speed up open elevator and stair shafts to the top of the unsprinklered 5-story brick, wood-joisted building. One of the 12 employees in the building lost his life attempting to escape from the fourth floor. Another suffered a heart attack at his desk on the second floor and died of suffocation.

July 20, Decatur, Ill. Newman's Store. $273,500.

Women's apparel. Responding to an outsider's alarm at 11:30 P.M. firemen were met by flames coming up the open stairway from the basement of the 3-story unsprinklered brick, wood-joisted building. Flames also burned through the thin wood elevator enclosure and extended up the shaft to the top floor. Damage was confined to the basement, third floor and part of the first floor.

***Oct. 21, Huntington, W. Va. J. C. Penney Co., et al. $889,500.**

Department store, motion picture theatre destroyed, 5 stores damaged. An estimated four hours of undetected burning preceded discovery of fire in the department store by a passerby at 4:56 A.M. By then fire had spread up open stairways from the point of origin on the first floor balcony to all parts of the unsprinklered 3-story brick, wood-joisted building. The 2-story brick, wood-joisted theatre across a 20-ft. alley was destroyed when embers ignited the combustible roof. Fire entered an adjoining building at several places through loose mortar joints in the 8-inch brick party wall, but in each instance was extinguished by sprinklers before causing extensive damage.

***Oct. 2, Sisseton, S. D. Stavig Bros., Inc., et al. $425,000.**

Department store, exposure housing three stores. At 5:30 A.M. a passerby discovered fire that originated in the basement of the 3-story wooden department store. Two hours later the building was destroyed and a 2-story wooden

multiple occupancy mercantile across the street was fully involved. Absence of automatic protection or watchman service, inferior combustible construction, combustible contents and inadequate public fire protection were notable factors. Thirty-three years ago the building of origin had been built to replace its predecessor destroyed by fire.

Nov. 11, Missoula, Mont. J. C. Penney Co. $250,000.

Clothing and dry goods. An explosion of fire gases at 8:21 P.M. was the first indication of fire in the unsprinklered 1-story brick, wood-joisted store. Fire originated on the mezzanine floor and spread above false ceilings.

Nov. 27, Fremont, Ohio. Joseph Department Store. $360,000.

Wearing apparel, yard goods. Fire, believed to have originated in a basement steam coil enclosure (part of an air conditioning system), spread by fans through metal ducts to all parts of the 8,000 sq. ft. basement of the unsprinklered 3-story fire-resistive building. Flames spread up open stairways to the first floor. Fire damage was confined to the basement and first story but heat and smoke spread through air conditioning ducts to cause heavy stock damage on upper floors.

Nov. 30, Halifax, N. S. Kay's, Ltd. $500,000. 10 dead.

Ten of thirty occupants were killed and eight were injured when fire broke out in a show window, flashed through the first floor and up an open stairway and elevator shaft, the only interior exits from the unsprinklered 4-story brick, wood-joisted store. A 16-year-old employee assisted four employees through a roof skylight and to the roof of an adjoining building. The fire was caused by ignition of cotton batting on the floor of the window by an electric arc from a defective extension cord to a window decoration. Fire flashed into the sales area decorated with combustible Christmas decorations and sheathed with fibreboard.

***Dec. 9, Zanesville, O. A. E. Starr Co., et al. $400,000.**

Department store, men's shop, office building. Defective wiring was the probable cause of fire that destroyed the attic, fourth and third floors of the unsprinklered 4-story brick, wood-joisted department store, spread to the third floor of the adjoining men's shop via wood joists that extended through the party wall, and also spread to the top floor of the adjoining 5-story office building through plain glass windows overlooking the roof of the department store. (See photo, page 192.)

***Dec. 17, Mt. Vernon, Ill. Glassman Department Store, et al. $750,000.**

Department store, three clothing stores, hotel. The overstocked department store basement was almost totally involved in flames when fire was discovered at 12:05 P.M., Sunday by a

Halifax Fire Dept.

Violation of several fundamentals of life safety resulted in the death of 10 department store occupants at Halifax, N. S., Nov. 30.

Acme

An overstocked department store basement was the point of origin of this fire at Mt. Vernon, Ill., Dec. 17. See report, page 218.

passerby. Fire spread up an open stairway and through the roof of the unsprinklered 1-story brick, wood-joisted building, then jumped 1-ft. parapets from roof to roof of three other stores in the block. A 200-room 5-story fire-resistive hotel separated from the building of origin by an alley in the rear suffered moderate damage when flames entered through glass windows.

Dec. 17, Boise, Idaho. Montgomery Ward & Co., et al. $290,000.

Open stairways and elevator shafts, lack of sprinklers, automatic detection equipment or watchman service were vital factors in the destruction of the 50 ft. by 120 ft. 4-story brick, wood-joisted building. Although the extent of fire when discovered by a passerby at 11:26 P.M. prevented definite conclusion as to the point of origin, the fire is believed to have started in the basement.

Five and Ten Cent Store

Nov. 27, Ironwood, Mich. Glassner Building. $293,000.

Five and Ten Cent store, clothing store, drug store, two restaurants, offices. At 1:40 A.M., Monday, occupants of a first floor coffee shop noticed smoke coming through the floor from fire that originated in the basement of the five and ten cent store and was by then beyond control. Flames spread through the undivided basement and vertically through an open stairway and nonfirestopped walls of the unsprinklered two-story wood-joisted building.

Dec. 2, Pottsville, Pa. F. W. Woolworth & Co., et al. $302,500.

Five and Ten Cent store, shoe store, military drill hall. The third serious fire at this location in 30 years burned out the basement, first and second stories of the unsprinklered 40 ft. by 170 ft. 4-story brick, wood-joisted building. Fire had made such headway when discovered by police at 12:51 A.M. that firemen were unable to enter the smoke-filled basement to confine the fire to this area. The first floor eventually collapsed.

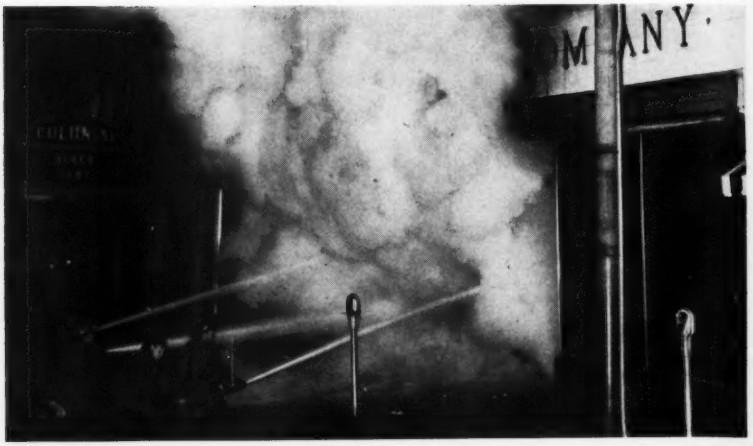
Furniture

***Jan. 9, Winston-Salem, N. C. Rominger's Furniture Co. $255,000.**

New furniture. The necessity of enclosing all vertical openings was evidenced by fire that originated during the night in the basement of the unsprinklered 2-story brick, wood-joisted store. Although the enclosure around the elevator shaft was effective, an open stairway offered a ready means for fire to reach the upper floors. Fire spread through unprotected doorways in a former party wall to an adjoining 3-story building also occupied by the store.

***Mar. 18, Statesboro, Ga. Bowen Furniture Co., et al. $300,000.**

Furniture store, feed store, barber shop, pool room, jewelry store. When an employee struck a match to light an LP-gas-fired radiant space heater, an explosion occurred that destroyed the 2-story brick, wood-joisted building. Two em-



Carl Wiegold

Furniture store fire at Winston-Salem, N. C., Jan. 9. See report, page 219.

ployees trapped in the rubble were saved from the flames that followed the explosion. Gas odors had been reported present in the building two days previous but gas company employees failed to find any leak.

Dec. 12, near Scottsbluff, Nebr. Jack Webber Furniture Store. $400,000.

Retail furniture. All floors of the 3-story brick, wood-joisted building were in flames when fire was discovered by police at 2:08 A.M. No sprinklers or watchman protection was provided. Although a private yard hydrant system had been installed it was too close to the burning building to be useful.

Grocery Store—Super Market

Oct. 28, Oakland, Calif. Hollywood Shopping Center. $257,500.

Food, liquor, clothing, hardware, jewelry, restaurant. This unsprinklered 1-story combustible building comprising a single fire area of 24,000 sq. ft. was destroyed by fire that originated at an incinerator in the grocery storage section. Congested combustible stock and absence of automatic protection and cut-offs allowed flames to spread rapidly into the sales area. A passerby discovered the fire at 10:50 P.M.

Multiple Occupancy

Jan. 6, Dayton, O. Virginia Cafeteria, et al. $291,500.

Restaurant, drug store, shoe store. When discovered by employees fire was confined to a cardboard locker in the basement, but due to a six-minute delay in sending the alarm smoke was so dense when firemen arrived that they could not descend the single stairway to the basement. The floor was eventually pierced, but partitions and deep joists made cellar pipes ineffective. After three hours the first floor collapsed and fire spread up through the unsprinklered 4-story brick, wood-joisted building.

Jan. 26, Ottawa, Ontario. Brennan Building. $259,500.

Auto supplies, refrigerator sales, art glass, three apartments. An overhead electric wire that fell on a neon sign is the reported cause of fire that destroyed the unsprinklered 3-story brick, wood-joisted building. Current from the high voltage street wire is believed to have burned insulation from the neon sign wiring, causing the latter to overheat within basement walls. Fire gained great headway within walls before discovery. Exploding containers of antifreeze and cylinders of refrigerant during the fire hampered fire fighting.

Feb. 24, Lewistown, Pa. J. W. Millree Motor Co., et al. $500,000.

Truck sales and services, auto body works, chicken hatchery, furniture store warehouse, etc. Absence of sprinklers, watchman protection and fire walls contributed to the destruction of this 2-story brick, wood-joisted building. The fire apparently originated in the garage in the first floor and had made considerable headway before discovery by neighbors at 9:22 P.M.

***Feb. 25, Willoughby, O. Willoughby Terminal Co., et al. $295,000.**

Shoe repair shop, five and ten cent store, drug

Dayton Fire Prevention Bureau

Another disastrous fire that started in an unsprinklered basement. Dayton, Ohio, Jan. 9. **See report, page 220.**

store. Gas escaping through a break in a buried 2-inch main seeped beneath the frozen earth crust into a 1-story wooden building housing the shoe repair shop and a 1-story brick, wood-joisted building housing two stores. Following a gas explosion at 5:05 A.M., firemen responded and discovered the wooden building and half of the other in flames. Because a fire wall dividing the latter building did not extend above the ceiling, flames spread through the blind attic to the other half of the building.

***Apr. 1, Hanover, Pa. Gitt Building, et al. $750,000.**

Twelve apartments, department store, cut rate store. A cigarette carelessly discarded during a party in a second floor apartment was the probable cause of fire discovered at 3:45 A.M. Flames cut off one stairway, but most occupants were able to escape down a second stairway. One family was rescued over ladders. Fire spread up through the roof of the unsprinklered 3-story brick, wood-joisted building and into the top floor of an adjoining 4-story building through plain glass windows.

May 20, Sudbury, Ont. J. Lahaye, et al. $250,000.

Three wearing apparel shops, grocery store, 8 apartments. Smoking in bed by an occupant of a second floor apartment was the cause of fire that destroyed the unsprinklered 2-story brick, wood-joisted building. Failure of the building owner to install a fire wall as recommended by the fire chief resulted in total destruction of the large-area building.

Nov. 20, Sherbrooke, Que. Dawson Auto Parts, Ltd. $270,000.

Wholesale and retail auto parts, sporting goods. The 7,500 sq. ft. first floor was involved when apparatus responded to a neighbor's alarm at 12:03 A.M. An open stairway offered an easy means for flames to reach upper floors of the 3-story brick, wood-joisted building. No sprinklers, detection equipment or watchman was provided.

Nov. 21, Joliet, Ill. J. R. Hobbs Building. $255,000.

Children's shop, toy shop, optometrist, barber shop. The janitor discovered fire in the basement of the unsprinklered 3-story brick, wood-joisted building and ran to the fire station near by to report the alarm at 11:50 P.M. Due to heavy smoke conditions firemen were unable to enter the basement but fought the blaze from the street, confining the fire damage to one end of the building. Cause of the blaze is unknown.

***Nov. 30, Thessalon, Ont. Stewart's Taxi, et al. $300,000.**

Taxi office, furniture store, barber shop, 3 apartments, offices. An oil stove in the unattended taxi office was the cause of fire that destroyed the 1-story combustible building of origin and the two adjoining 2-story brick, wood-joisted buildings. When first noticed by a passerby at 5:30 P.M. the store was in flames and oil was burning on the floor.

***Dec. 20, Somerset, Ky. Weddle & Richardson Bldg. $565,000.**

Two department stores, restaurant, barber shop. Responding to an outsider's alarm at 1:05 A.M., the poorly manned and equipped fire department found an unsprinklered 3-story brick, wood-joisted building filled with smoke and fire burning rapidly in the restaurant kitchen on the first floor. Flames spread to unoccupied upper floors through an open stairway and an hour later ignited stock in the basement of an adjoining unsprinklered 3-story brick, wood-joisted department store. Fire communicated to the basement of the department store either through pipe openings in the fire wall or by ignition of stock piled against the wall. Two hours later fire spread to a second department store adjoining the first. Falling not-self-releasing floor joists set in the intervening fire wall pulled bricks loose through which fire spread to the second store.

***Dec. 27, Magog, Que. A.B.C. Radio Shop, et al. $300,000.**

Three buildings housing 8 stores, 8 apartments and 2 offices. When apparatus arrived flames were coming from the roof of the unsprinklered 4-story wooden building housing four retail stores and two offices. Within minutes fire had involved adjoining 3- and 4-story wooden building not separated by fire walls.

Total Mercantile Losses: $11,377,000.
12 killed.

Kepler Studio

Multiple occupancy building, Lewiston, Pa., destroyed Feb. 24. **See report, page 220.**

Storage

Cold Storage

***Jan. 14, near Clyde, N. Y. Clyde Cold Storage. $462,000.**

Vegetables, fruits, eggs. Driven by a 90 mph wind, fire originating in a 20 ft. square wooden receiving building spread to an unsprinklered 3-story brick, wood-joisted cold storage plant 25 ft. away. Firemen attempted to enter the engine room with hose lines, but were driven out by escaping ammonia. Fear of casualties to firemen from three arcing transformers on poles outside the latter building delayed use of outside hose streams until current was cut off. By then flames had made great headway and were beyond control.

Cotton

Mar. 26, Chickasha, Okla. Oklahoma Compress Company. $632,000.

One section of four section warehouse and compress; 4,000 bales. Ignition of trash beneath a wooden loading platform by a carelessly discarded cigarette was the probable cause of fire that was driven by a 45 mph wind into the unsprinklered wood-frame, metalclad 93,000 sq. ft. compress section. The watchman was fighting the fire with a yard hydrant hose when the fire department arrived, summoned by an outsider. Fire walls with protected openings prevented spread to adjoining storage sections.

Electrical Equipment

Aug. 25, Portland, Ore. Westinghouse Electric Supply Company, et al. $727,500.

Wire, pole line hardware, motors, crated electrical appliances. Contact of an exposed wire on an electric lift truck with a metal storage rack caused fire that spread rapidly through the undivided and unsprinklered 40,000 sq. ft. 1-story building. The fire was a good illustration of the severe damage that can result when noncombustible materials are stored in combustible crates, cartons and wrappings. On discovering the fire employees attacked it with hand extinguishers but did not give the alarm, which was transmitted by an outsider three blocks away who saw smoke.

Dec. 16, Fond du Lac, Wisc. Sanitary Refrigerator Company. $750,000.

Warehouse heavily stocked with refrigerators. At 5:00 A.M., one hour after the watchman had inspected the unsprinklered three-story brick, wood-joisted building, flames were discovered coming from the roof. The fire is

Wide World

Fire Aug. 25 at an electrical equipment warehouse at Portland, Ore., illustrated that severe damage can result when noncombustible materials are stored in combustible containers in an unsprinklered building.

believed to have originated on the second floor near the elevator shaft, from where it spread up the open shaft to the undivided upper floors and the roof.

Food Products

Feb. 15, near Salinas, Calif. Spreckels & Union Sugar Co., et al. $279,500.

11,593,500 lbs. of sugar in paper bags, 100 lbs. each, damaged by fire and water. Layers of canvas that had been placed beneath a loose fitting door to keep out mice was believed to have been ignited by a weed burner. Fire had made considerable headway in a 10,000 sq. ft. section of the unsprinklered high 1-story wood-frame aluminumclad structure when discovered by a railroad employee at 12:59 P.M. No watchman had been provided during lunch hour. Rapid melting of the aluminum siding and roofing ventilated the building quickly and allowed firemen to reach a substandard partition of plaster board on wood studs with hose streams. Fire was thus kept from the adjacent storage area. Approximately 60 per cent salvage of sugar was realized.

May 27, Philadelphia, Pa. Frankford Grocery Co. $658,000.

Miscellaneous packaged and canned groceries. Fire originating in the 59,768 sq. ft. fourth floor of the unsprinklered 4-story, fire-resistive building burned for 22 hours. Groceries stacked from floor to ceiling completely blocked all windows, preventing firemen from getting water on the blaze. During this period of burning the roof slab expanded 15 to 18 inches and corner columns and brick curtain walls at one end of the building were fractured and pushed out about 9 inches. Steel reinforcing rods prevented complete failure and collapse of columns.

June 26, Pearl Harbor, T. H. U. S. Navy. $487,500.

Commissary storage. A defective thermal control device on an electric hot plate left on after closing in the office personnel lounge was the probable cause of fire that destroyed the unsprinklered and undivided 41,400 sq. ft. 1-story wooden building. Foreseeing early collapse of the 4-inch concrete roof deck firemen were forced to fight the fire from outside. Factors contributing to the total destruction were delayed detection (no watchman), no sprinklers, high winds, lack of fire walls, and roof construction not compatible with supporting structural members.

Oct. 15, Whiteville, N. C. G. V. Singletory & Sons. $250,000.

Wholesale groceries, seed, oats and rye. Fire was beyond control in the recently built 15,000 sq. ft. 1-story masonry, wood-joisted building when discovered by police shortly after midnight. No automatic protection or watchman service was provided.

***Oct. 19, Twin Falls, Idaho. Long Valley Produce Co., et al. $850,000.**

Four warehouses, potatoes, farm produce, seed, department store stock. A 9,500 sq. ft. 1-story wood-frame, metalclad potato warehouse was in flames when fire was discovered by an outsider at 10:00 P.M. Lack of adequate protection, insufficient clearance between combustible buildings, high winds, and inadequate fire department manpower and equipment allowed flames to spread over a 15-ft. alley to three other combustible warehouses.

Grocery warehouse, Philadelphia, Pa., May 27.

Nov. 11, E. Grand Forks, Minn. F. & L. Boushey. $255,000.

Storage and washing of potatoes. Fire that originated in the oil burner room on the second floor burned for at least 30 minutes before discovery by an outsider at 7:05 P.M. One hundred and thirty thousand bushels of potatoes in metal bins were destroyed as fire spread through the unsprinklered and undivided 80 ft. by 250 ft. 2-story quonset type, all wood building located in a railroad yard. A yard hydrant or a 4-inch main and a public hydrant 700 ft. from the fire on an 8-inch main were the only available water supplies.

Furniture

Feb. 3, Brooklyn, N. Y. T. L. Fazio. $275,000.

New furniture. Flames were coming through the roof of the 5-story brick, wood-joisted warehouse when discovered by an outsider at 8:31 P.M. Origin was in the rear of the third floor, from where fire spread to all parts of the building through unprotected fire wall openings and open shafts. No sprinklers or warehouse protection was provided.

Grain Elevator—Country

***Feb. 5, Portland, N. D. Portland Farmers Union. $250,000.**

One 40,000 bu., one 60,000 bu. grain elevator, office, coal shed. "Beyond control when discovered" describes fire possibly caused by a cigarette carelessly discarded in dust under the scale in the basement of the unsprinklered 90-ft. high wood-frame, metalclad 40,000 bu. elevator. Discovery was by a passerby at 11:45 P.M., 33 hours after the elevator had shut down for the weekend. The 60,000 bu. annex, an office building and coal shed, all seriously exposed and of combustible construction, were also destroyed.

***April 26, Wells, Minn. Frank Bros., et al. $670,000.**

40,000 bu. flaxseed, 40,000 bu. soybeans, 20,000 bu. corn and oats; poultry processing and cold storage. A 60-ft. high wood-frame, metalclad elevator was destroyed by fire that was discovered in a flaxseed storage bin in the elevator at 8:15 A.M. by employees. Spontaneous heating of flaxseed was the probable cause. Employees had noticed excessive heat in the flaxseed on the previous day. Firefighters were unable to prevent destruction of an adjacent 1-story masonry, wood-joisted poultry processing and cold storage plant ignited by sparks carried by high winds. During the fire the roof was blown from the building by a violent explosion. An ammonia tank reportedly exploded.

Metal Products

***Jan. 2, Norfolk, Va. Empire Machinery & Supply Corp., et al. $538,500.**

Machinery and mill supplies. Fire that in all probability could have been extinguished with not more than $2,500 damage had the fire department been called immediately on discovery destroyed three buildings and severely damaged another, all because an employee on discovering

When fires are permitted to burn for long periods before detection, damage is likely to be total, as was the case at this grain elevator at Portland, N. D., Feb. 5.

A water curtain successfully protected exposed buildings at Norfolk, Va., Jan. 2.

the fire in a second floor file room spent 10 minutes trying to extinguish the blaze with first aid extinguishers before giving the alarm. When finally forced from the room he left the door open, permitting flames to spread through the second floor of the unsprinklered 4-story brick building. A back draft soon after apparatus arrived forced firemen from the building and sent flames through open stair and elevator shafts to all floors. When a brick wall collapsed two adjacent 1-story wooden buildings were destroyed and heat ignited the upper floors of a four-story brick, wood-joisted building across a fifteen-foot alley. Because stock was piled to the ceiling in the latter structure holes had to be cut in the roof to get at flames in the top story. Holes were then cut in the floor to extinguish fire in the third story. A water curtain confined the damage to windows on two other exposed buildings.

Mar. 10, Hamtramck, Mich. Motor Products Corp., et al. $360,000.

Automobile body parts. Sparks from a cutting torch being used on the roof to remove a spray booth vent stack ignited the underside of the wood roof deck. A fire guard stationed inside was apparently unable to check fire with a hand extinguisher. Fire spread rapidly over paint residues left on walls and roof by the previous occupant and was beyond control in the unsprinklered 40,320 sq. ft. 1-story masonry, steel framed building when apparatus arrived.

April 22, Chicago, Ill. Container Corp. of America, et al. $540,000.

Machinery, wood skids, paper cartons. Incendiarism was the probable cause of fire that destroyed the 100 ft. by 150 ft. unsprinklered 5-story brick, wood-joisted building. A 12-inch thick fire wall that divided the structure into two equal sections proved ineffective either because fires were set in both sections or because fire doors were blocked open. Poor fire cut-offs between floors permitted rapid vertical spread. A fire wall with protected openings prevented spread to an adjoining 1-story building, but falling walls damaged the roof.

Dept. of Police, Hamtranck

Despite the presence of a fire guard, fire caused by sparks from a cutting torch spread beyond control in this warehouse at Hamtramck, Mich., March 10.

Military

***March 30, North Camp Hood, Texas. Texas National Guard. $1,020,000.**

Tents, pillows, mattresses, ordnance parts, gasoline, oil. Absence of automatic protection or watchman service permitted fire to make headway in one of six storage sections in a 300-ft.-long 1-story wooden warehouse before discovery at 2:30 P.M. Within 50 minutes that building and a similarly constructed seriously exposed warehouse parallel to it were leveled. Inadequate fire equipment at the camp, a 20 mph wind, congested combustible storage and substandard fire walls influenced the rapid spread. Fire walls were constructed of 8-inch thick concrete tile. All collapsed during the fire.

June 17, Voorheesville, N. Y. U. S. Army. $2,500,000.

General engineer troop supplies. Failure to protect this 960 ft. by 180 ft. 1-story brick, wood-truss building with sprinklers resulted in destruction of a 43,200 sq. ft. section at one end of the building. A fire wall with protected openings was a major factor in preventing spread to the adjoining storage section although, because there were no wings on the firewall between the main roof and monitor roof, hose streams were twice needed to extinguish fire that spread beyond the fire wall via the wooden monitor. See detailed report, Oct. 1950 *Quarterly*, p. 131.

Miscellaneous

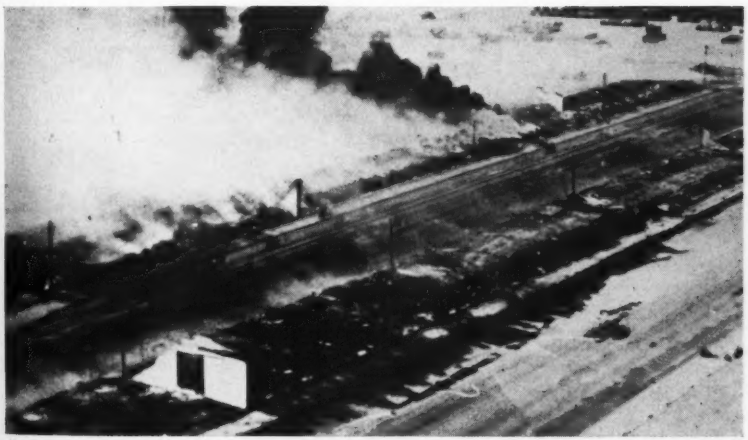
Mar. 17, Quebec, Que. Gov't of Canada, Maritime Services. $260,000.

Miscellaneous navigation supplies. Heat escaping from a smoke pipe joint over a long period of time is believed to have caused a smoldering fire in the space between the furnace room ceiling and the first floor of the 130-yr.-old building. When discovered by a furnace room attendant, fire had progressed to such an extent that flames were issuing from two windows on the first floor. The large piles of lumber stored on the first floor were fully involved. Firemen wearing gas masks tried to prevent fire from involving the entire unsprinklered 3-story stone, wood-joisted building, but were unsuccessful because of a sub-standard fire wall that did not extend to and through the roof.

Multiple Occupancy

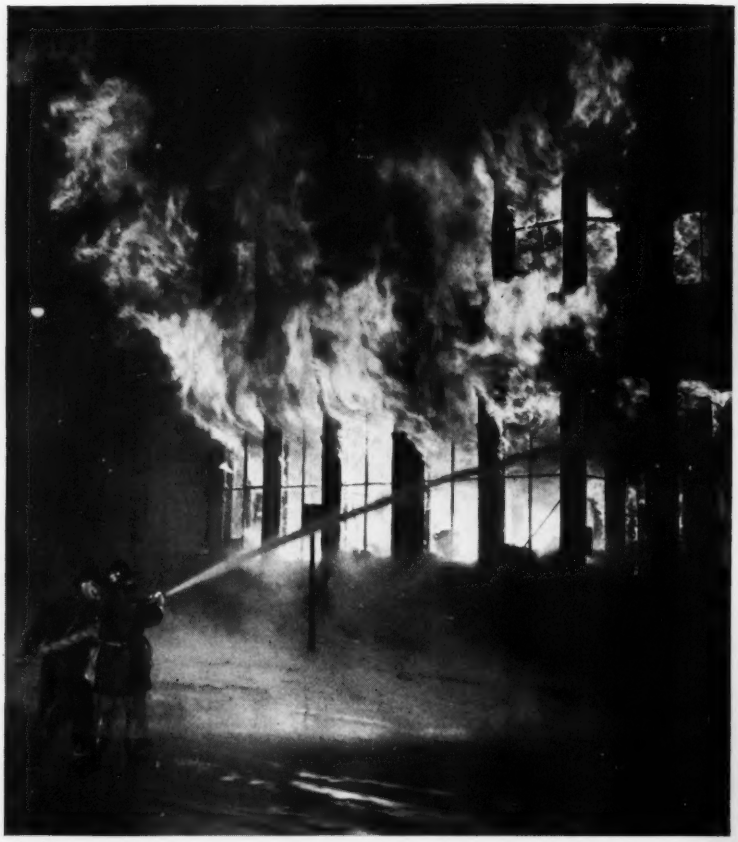
Nov. 15, Aurora, Ill. Edward Clark Building. $290,000.

Electrical supplies, groceries, plumbing supplies, roofing, ice cream manufacturing. At 4:38 A.M. an outsider heard an explosion and saw part of one wall of the unsprinklered brick, wood-joisted building blow out. Fire was by then out of control and gradually spread to all parts of the structure via the wood roof and combustible partitions that separated the various occupancies. When flames reached the ice cream plant ammonia tanks exploded.



Acme

This picture shows the substandard fire walls constructed of 8-inch thick concrete tile that collapsed during the fire at North Camp Hood, Texas, March 30.



Roland Oxton

This picture taken by a photographer who responded with the first fire apparatus shows the extent of fire shortly after firemen arrived at a Boston warehouse, March 9.

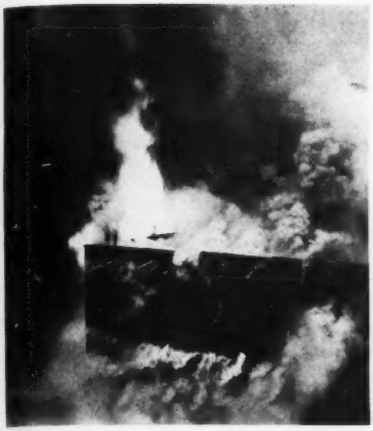
Paper

***Mar. 9, Boston, Mass. Cook-Vivian Paper Co., et al. $775,000.**

Paper storage and working, electrical supplies, offices. Upon arrival of the first fire company in answer to an automatic alarm at 2:57 A.M. the entire first floor of the unsprinklered 4-story brick, wood-joisted building was in flames and before the arrival of the complete first alarm assignment fire had spread to all floors. The fire is believed to have originated in a concealed floor space beneath a fireplace on the second floor. According to the Boston Fire Department the temperature of the building increased too slowly to operate the automatic rate-of-rise fire alarm until the fire broke out of the concealed space and flashed through the building. Fire spread from the rear of the building of origin (fire shutters open) across a 20 ft. alley to the rear of all floors of a sprinklered 5-story building (no shutters) where it was held in check by 27 sprinklers. A building adjoining the building of origin suffered slight damage when fire spread around a fire wall and entered rear windows.

***May 6, New York, N. Y. Avrick Paper Co. et al. $400,000.**

Paper storage, offset printing, publishing house. Absence of sprinklers and watchman



Acme

Paper warehouse fire at New York, May 6.

service permitted fire to develop for several hours before discovery by an outsider at 7:05 A.M. Fire destroyed the 5-story brick, wood-joisted building of origin occupied for paper storage and offset printing and spread to and destroyed a 5-story paper warehouse exposed at the rear. Wall collapse crushed an adjacent 2-story brick, wood-joisted publishing house.

Rubber

***Mar. 15, N. Kansas City, Mo. Goodyear Tire and Rubber Co., et al. $3,920,000.†**

80,000 tires, 70,000 tubes; tenant manufacturing exposure. Fire in this rubber warehouse emphasized the vulnerability of fire-resistive buildings without sprinkler protection to structural damage when exposed to severe contents fires. Originating near an open switch and fuse cabinet fire spread rapidly through containers of tubes on the third floor and later extended to the second and first floors via the freight elevator. Shaft doors were apparently open or partly closed. Considerable areas of the roof, fourth and third floors collapsed and part of a wall fell in before the fire could be controlled. Fire was prevented from consuming the contents of a 9-story fire-resistive building 90 ft. from the fire by the operation of 100 sprinklers.

Total Storage Losses: $17,150,000.

Acme

This fire demonstrates the vulnerability of unsprinklered fire-resistive buildings to structural damage, N. Kansas City, Mo., March 15. Detailed report 9pril 1950 *Quarterly*, page 267.

Habitational Buildings

Apartment

April 1, Philadelphia, Pa. Fairfield Apartments. $546,000. 1 killed.

Thirty-eight-apartment building. One occupant, who apparently was prevented by smoke from reaching a stair tower, died in fire that originated in the basement of the unsprinklered 4-story brick, wood-joisted building. An outsider gave the alarm at 10:44 P.M. The approximately 100 other occupants made their way to safety down stair towers as flames swept up an open stairwell and elevator shaft. Failure to separate the four wings of the building by fire walls allowed fire to spread to all parts of the structure.

Dwelling

Feb. 21, Phoenixville, Pa. William J. Clothier. $285,000.

Twenty-five-room mansion. A spark from a wood fire in an open fireplace in the dining room was the probable cause of fire that destroyed this 2½-story mansion. A 30-minute delay in calling the fire department following discovery by an occupant allowed fire to involve the whole building before apparatus arrived.

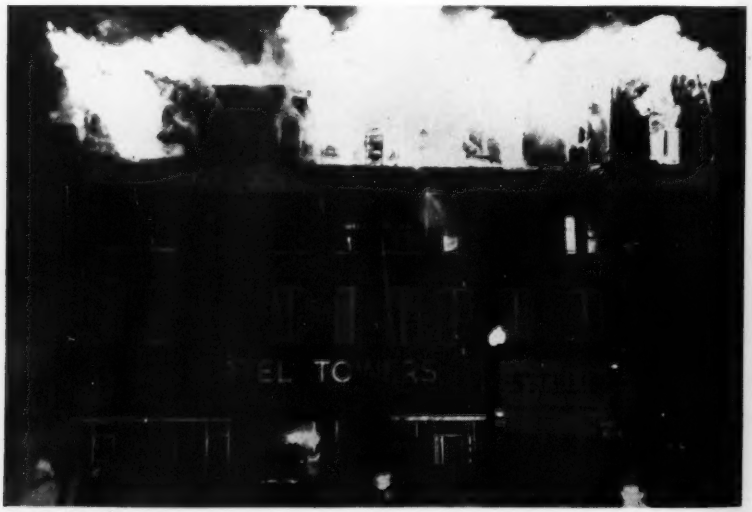
Hotels

***Feb. 1, Dickinson, N. D. St. Charles Hotel, et al. $353,000. 1 killed.**

Hotel, restaurant, bar, two clothing stores, furniture store, three offices. One guest died (possibly from a heart attack) in fire that destroyed the unsprinklered 3-story brick, wood-joisted hotel, and jumped across the street to destroy a 1-story wooden mercantile building. At midnight fire was discovered in the basement boiler room and supposedly extinguished with first aid extinguishers. The fire department was not summoned until 3:00 A.M. when guests noticed smoke. The fire had entered a concealed wall space in the boiler room and was spreading up through the building within nonfirestopped walls when apparatus arrived.

Feb. 22, Glens Falls, N. Y. Hotel Towers, et al. $250,000.

Hotel, stores and offices. Careless smoking in a second floor guest room caused fire that destroyed the 78-year-old unsprinklered 4-story brick, wood-joisted building. After a futile attempt to put out the blazing mattress the guest fled the room without giving the alarm, flames following him through the open door



International

Careless smoking in a guest room caused fire that destroyed this unsprinklered hotel at Glens Falls, N. Y., Feb. 22.

into the corridor. The only interior escape route was thereby cut off since stairways from upper floors, although cut off at each floor level by fire doors, discharged into the second floor corridor. Guests were pleading to be rescued at windows on all upper floors when apparatus responded to an outsider's alarm at 4:15 A.M.

Feb. 28, Spokane, Wash. Ridpath Hotel, et al. $1,122,500.

194-room hotel with stores on first floor. At 7:10 P.M. a guest reported smoke issuing from the freight elevator opening in the sidewalk, but no alarm was given when investigation by a bellhop failed to reveal fire in the hotel basement. The alarm was given at 7:23 P.M. when smoke came up the elevator shaft into the lobby. All 200 guests escaped, many over fire escapes. The fire originated in an unsprinklered basement area used for storage by the stores and spread up a light shaft and elevator shaft to all floors of the 5-story brick, wood-joisted building. A makeshift, grossly substandard sprinkler system had been installed in 21 per cent of the basement. Alert firemen prevented fire from spreading to the basement of an adjoining 2-story building through a 1-ft. square opening in the fire wall, and to the second floor via wood flooring under a fire door.

***April 14, Mitchell, S. D. Widmann Hotel, et al. $500,000.†**

Three buildings housing a hotel, apartments, lodge rooms and stores. At 8:00 A.M. the hotel desk clerk discovered smoke coming from lodge rooms on the first floor of the unsprinklered 4-story brick, wood-joisted building. All occupants escaped safely before flame spread through vertical openings to all floors. Hampered by inadequate water supplies and firefighting equipment, firemen were unable to prevent spread to an adjoining multiple occupancy mercantile and a 3-story building across the street housing apartments and stores. Aid from 13 fire departments was required.

April 14, Bangor, Me. Windsor Hotel. $336,500.

100-room hotel. Fire originating in an employee dressing room in the basement spread throughout the unsprinklered 3-story brick, wood-joisted building within nonfirestopped walls and above false ceilings out of reach of hose streams. Fire fighting was delayed while the more than 85 guests were safely evacuated by means of ladders, fire escapes and over stairways. A hotel employee who was sent to locate the cause of a flashing hotel switchboard signal light from a basement telephone discovered the fire at 6:36 A.M.

June 27, Mt. Freedom, N. J. Hotel Saltz. $250,000.

40-room summer hotel. One week before the hotel was to open for the season fire originating in the non-cut-off basement boiler room destroyed the unsprinklered 2-story wooden building and a communicating 1-story dining room and kitchen. Although a watchman re-

A 13-minute delay in notifying the fire department was a vital factor in this hotel fire at Spokane, Wash., Feb. 28.

Acme

Hotel fire, Bangor, Me., April 14. See report, page 231.

portedly made a complete tour of the building every half hour the fire was first discovered by a motorist at 1:13 A.M. Explosion of several of the 31 LP-Gas tanks in the yard and connected to kitchen ranges hampered fire fighting.

Dec. 25, Huntington, W. Va. Adelphia Hotel, et al. $300,000.

Hotel, six stores. Sparks falling down the open elevator shaft and noticed by a guest in the hotel lobby at 1:53 P.M. were the first indication of fire that had originated at elevator machinery at the head of the shaft. Flames were by then mushrooming through the undivided attic and before being controlled also burned out part of the fourth floor of the unsprinklered 150 ft. by 175 ft. 4-story brick, wood-joisted building. Water and smoke damage was heavy on lower floors. Overheating of the conductors to the elevator motor or overheating of the motor itself was the probable cause. Investigation revealed that 60 ampere fuses had been replaced by 120 and 180 ampere fuses as overload protection for the motor and wiring.

Rooming House

***March 2, Montreal, Quebec. Lotus Garden Hotel, et al. $281,500. 8 killed.**

Nine 3-story buildings with stores and restaurants on first floor, rooming houses above. One 1-story garage. Eight persons in the Lotus Garden Hotel (a rooming house) were killed when fire originating in a first floor restaurant swept through the unsprinklered 3-story brick, wood-joisted building. Awakened by an explosion at 6:08 A.M. occupants found escape through hallways blocked by smoke and flames. Of the 25 hospitalized, many had been injured in jumps from windows. Many escaped by means of a rear outside fire escape. Before being controlled fire destroyed or damaged all buildings crammed within a block in the Chinatown section of the city. Spread to other buildings was facilitated by unprotected doors and windows in party walls.

Hospital

Nov. 20, Bethel, Alaska. Alaska Native Service Hospital. $300,000.

The hospital staff and citizens are deserving of highest commendation for evacuating without casualty the 300 typhoid epidemic patients in the unsprinklered 2-story wooden building and adjoining quonset type building. Temperature was 5 below zero. No fire department or water supply was available. Efforts to thaw a pipeline to the Kuskokwim River, the only water supply except ice, may have caused the fire. Although steam lines paralleled the pipeline it had frozen up on past occasions. Due to inaccessibility of Bethel to a source of sand and gravel it was impossible to build the hospital of fire-resistive materials.

Total Habitational Losses: $4,524,500.
10 killed.

Miscellaneous

Aircraft Hangars

Jan. 16, near Fort Wayne, Ind. Indiana Air National Guard Hangar. $821,000.

Hangar, 10 aircraft. Short circuit in a fuse box ignited combustible fibreboard which, in turn, ignited the insulation on the interior of the 135 ft. x 341 ft. metal hangar. When discovered by a passerby at 10:30 P.M., walls of the structure were red hot. When the large doors were opened the interior of the building burst into flame. The intense heat and exploding fuel tanks prevented effective fire control.

Mar. 14, Crumlin, Ont. Royal Canadian Air Force. $1,030,000.

38,400 sq. ft. hangar used to garage 15 trucks, including 8 mobile radar units. Fire originated in an adjoining and communicating room and spread into the unsprinklered 1-story combustible hangar. Ten minutes after discovery the entire building was in flames.

Buildings Under Construction

Jan. 24, Huntington Park, Calif. S. Genis, et al. $250,000.

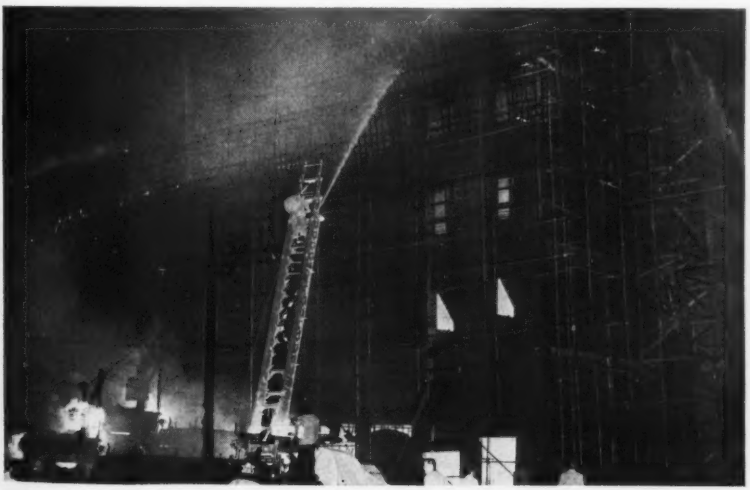
Department store under construction. Failure of the building contractor to leave a watchman on duty at the construction site gave two boys, aged 12 and 14, opportunity to remove a bucket of gasoline from a hoisting engine in the basement, take it to the second floor and set fire to scrap material and scaffolding. Flames were coming from the partially completed roof of the 3-story building when discovered by a policeman at 10:27 P.M. Windowless walls handicapped fire fighting.

Mar. 16, Sodus, N. Y. Sodus Central School. $254,000.

Nearly completed 2-story fire-resistive school. Fire originating in the cafeteria being used by the contractor's employees as a locker room and for storage of a large amount of combustible building materials spread to corridors and rooms on the first floor through openings not as yet protected by fire doors. Fire doors where hung functioned properly to prevent spread. Although the fire had made considerable headway before discovery by the janitor at 4:00 A.M., damage would undoubtedly have been much less had the fire department been notified promptly. Because the janitor did not know how to notify the town's volunteer department, the alarm was not given until 5:26 A.M.

***Sept. 7, St. Laurent, Que. Suburban Enterprises, Inc. $500,000.**

Four apartment groups destroyed, 4 damaged. Groups consisted of four or five adjoin-



Three large loss fires involved buildings under construction during 1950. This one occurred at Huntington Park, Calif., Jan. 24.

Richmond Times-Dispatch

Fire was beyond control in this church at Richmond, Va., when discovered by neighbors at 3:11 A.M., Nov. 26. See report, page 235.

ing 3-story wood, brick veneered buildings in various stages of construction. Fire had made considerable headway when discovered by persons a block away at 6:05 P.M., 50 minutes after the contractor's watchman reportedly checked the building of origin. Firemen could probably have confined the fire to the unit of origin had hydrants been available at the scene and the street not been impassable due to installation of a 12-inch water main.

Churches

Jan. 1, Cambridge, Md. Zion Methodist Church. $297,000.

Summoned by outsiders at 1:05 A.M., firemen were about to enter the smoke-filled basement to locate the fire when an explosion (presumably of fire gases) occurred that blew off the door at the head of the basement stairs. Flames immediately enveloped the basement, spread up the stairs to the main floor and were not extinguished until the 1-story stone, wood-joisted church was destroyed. Its predecessor had been destroyed by fire in 1910. A pumper less than two years old broke down early in the fire when two cylinders were driven through the engine due to overload.

Mar. 10, Blackwell, Okla. First Baptist Church. $266,500.

Church with attached educational building. Fire originating in the sub-basement furnace room of the 3-story brick, wood-joisted church spread through the concealed space behind the organ to the undivided attic, and spread through unprotected doorways and through heating ducts to the adjoining church school building. Police on being notified of the fire by an outsider at 2:25 A.M., sent a policeman to confirm the report, delaying notification of the fire department 25 minutes.

***Mar. 13, Brooklyn, N. Y. Congregation Agudath Achim, et al. $250,000.**

Synagogue, recreation building, rooming house. Before discovery by a passerby at 3:02 A.M., fire originating in the basement had spread through nonfirestopped walls to all parts of the unsprinklered 2-story stone, wood-joisted church, had broken through the roof and extended to the upper two floors and attic of an adjacent 3-story wooden recreation building. After apparatus arrived fire ignited combustible siding of a 3-story rooming house on the other side of the church but firemen prevented fire damage to the interior.

Oct. 23, Chicago, Ill. St. Alphonsus Church. $310,000.

Possibly caused by sparks from an acetylene torch used in repairing the steeple, fire that originated in the loft destroyed the upper portions of the 85 ft. x 210 ft. 3-story masonry building.

***Nov. 26, Richmond, Va. Monument Methodist Church. $421,000.**

Church, apartment house. Fire was beyond control in the unsprinklered 2-story brick, wood-joisted church when discovered by neighbors awakened at 3:11 A.M. The roof and part of the third floor of an adjacent 3-story apartment house were destroyed when flames issuing from church windows ignited the exposed wooden cornice of the apartment building.

Conflagrations

***May 6, Rimouski, Que. Price Bros. & Co., et al. $14,000,000.**

15,000,000 ft. lumber in yard, 2 sprinklered lumber mills, 319 homes, 20 stores, theatre, hotel, court house, hospital, 2 schools destroyed. A severe lumber yard exposure, high winds, dry weather, flying brands and inadequate fire-fighting equipment and manpower during the early stages were vital factors in this fire that originated in the lumber yard. General absence of combustible roof coverings was undoubtedly the reason why so much of the town was saved. (See July, 1950 *Quarterly*, page 45, for report.)

***May 9, Cabano, Que. George Pelletier, et al. $1,640,000.**

Lumber yard and mill, 118 homes, 33 business establishments destroyed. Factors noted in the Rimouski conflagration were also important at Cabano. Sparks from a waste burner set fire to the lumber yard. High winds spread flames to exposed buildings and carried burning embers that set fires in four parts of the town. (See July, 1950 QUARTERLY, page 45, for report.)

Country Clubs

Jan. 1, Verona, Pa. Westmoreland Country Club. $384,000.

Failure of employees preparing a New Year's Eve dinner to call the fire department for a small grease fire under the hood of a kitchen range was responsible for the destruction of this unsprinklered 3-story wooden building. Visible flames were put out with hand extinguishers, but fire burned undetected above the kitchen ceiling until smoke was noticed at 12:15 A.M. Flames spread through nonfirestopped walls and ceiling spaces and were coming through the roof when firemen arrived. The 300 guests escaped safely.

Dec. 1, Florham Pk., N. J. Braidburn Country Club. $250,000.

30-room converted mansion. A 70-minute delay in getting water on the fire resulted in destruction of the 3-story masonry and wood mansion that had recently been converted to its present occupancy following destruction of the former club house by fire Dec. 10, 1949. When discovered fire was confined to a maid's room on the third floor but spread throughout the structure before water could be relayed by three pumpers in series from the nearest hydrant 3,500 ft. away. A large pond on the club

The Cabano, Que., conflagration of May 9 followed by 3 days the Rimouski disaster.

A grease fire under the hood of a kitchen range was responsible for the destruction of this country club at Verona, Pa., Jan. 1. See report, page 235.

grounds that would normally supply pumpers had been drained to remove debris.

Dance Hall

Jan. 14, San Antonio, Tex. Olmos Dinner Club. $315,000.

Dance hall and restaurant. Fire originated in the ladies rest room, probably from a carelessly discarded cigarette in the waste basket. The fire department was called after the occupants had attempted to extinguish the blaze with buckets of water. All patrons escaped but the 3,670 sq. ft. 1-story stuccoclad structure was enveloped in flames when apparatus arrived.

Forest Fires

May 14, Porcupine River, Alaska. $1,286,000.

529,900 acres burned. Fire caused by campfire. This and the fires at Black River and Venetic burned areas containing some of the finest white spruce timber in interior Alaska. The destroyed area also contained a great deal of caribou range and was considered one of the finest marten areas in Alaska. Thirty to 100 years are required to establish a caribou range. Ten years elapse before fur bearing animals are again established in a large burned area. Since natives live off the territory, whole villages usually must migrate to new areas following fires such as these three.

May 17, Venetic, Alaska. $468,500.

295,800 acres burned. Fire caused by lightning. See forest fire May 14, Porcupine River, Alaska.

May 17, Black River, Alaska. $2,902,000.

892,900 acres burned. Fire caused by campfire. See forest fire May 14, Porcupine River, Alaska.

***Aug. 16, near Conejos, Calif. El Capitan Indian Reservation, et al. $4,000,000.**

56,000 acres of mixed ground cover, 28 structures. Originating during a period of rising fire danger fire spread with great rapidity, traveling three miles in two hours and continued out of control until the fourth day when a change in weather conditions and type of timber involved permitted direct attack on the head of the fire and backfiring on the flanks. Although the cause of the fire is unknown, fire officials believe it may have been set by someone influenced by local propaganda to burn brush for better grazing, for more water, and for reduction of fire hazard.

***Aug. 19, Melones, Calif. Carson Gold Mining Corp., et al. $360,000.**

2,670 acres grass and forest land, 12 structures, including dwellings and buildings of a nonoperating gold mine. Fire suspected of being set, started two miles from Melones and

Acme

This forest fire that started near Conejos, Calif., Aug. 16, burned out of control for four days, destroying 56,000 acres and 28 structures. See report, page 236.

was discovered in time to permit several Forest Service pumpers to assemble in the town to protect it from the approaching fire. However, attempts to save the Town were futile due to the severe grass exposure to most of the buildings, the spot fires, combustible construction, wood shingle roofs and lack of water.

Sept. 3, Calif. Stanislaus National Forest. $1,500,000.

25,000 acres commercial and second growth pine. Lightning caused fire that destroyed 125 million board feet of timber and 10,000 acres of average 25-year-old ponderosa pine timber. Cost of suppressing the fire was $150,000.

Garages

Mar. 23, Chicago, Ill. International Harvester Co. $500,000.

Sales and repair shop. 75 trucks. Fire originated in the repair shop section at 6:02 P.M. from an unknown cause and aided by exploding gasoline tanks spread rapidly through the open area of the 1-story brick, steel-framed building. Despite the 57 pieces of apparatus assembled at the scene, the entire 125 ft. x 400 ft. structure was destroyed.

***June 23, Fullerton, Calif. McCoy and Mills Ford Agency, et al. $268,000.**

Automobile sales and service, citrus fruit processing, 58-room hotel, hardware store. Fire that was confined to the upholstering department on the first floor of the unprotected 1-story brick, wood-joisted garage when discovered by police at 3:49 A.M., spread to wood rafters and gained impetus on reaching the paint room on the mezzanine floor. Intense heat ignited the interior of a masonry walled fruit juice processing plant across a 20-foot alley, where citrus oils and alcohol intensified the fire. When the garage wall adjacent to the 3-story hotel building collapsed, flames entered windows in the exposed stuccoclad wall of the hotel. All guests had been evacuated.

***Oct. 10, North Sydney, N. S. Lamie Motors, Ltd., et al. $400,000.**

Public garage, 2 warehouses, 40-room hotel, 3 dwellings destroyed. An area 500 ft. by 600 ft. congested with combustible buildings was swept by fire that originated in the 2-story garage and service station. When discovered at 4:30 A.M. the building was totally involved. Soon after the arrival of the one fireman on duty an explosion wrecked the roof, blew out windows and spread fire to an adjoining 3-story wooden warehouse. The weakness in manpower and equipment of the fire department was an important factor in the loss.

Dec. 27, Streator, Ill. Kaiser Frazer Garage et al. $259,000.

Two auto sales and service garages, 27 autos. When an auto in the repair shop fell off the jacks on which it was resting a hole was punched in the fuel tank. Released gasoline was immediately ignited, possibly by a friction spark. Fire spread rapidly intensified by gasoline in vehicle fuel tanks and by paint and thinner in the not-cut-off paint spray area. Flames spread to an adjoining garage through

Acme

Fifty-seven pieces of fire apparatus were unable to save this garage from destruction by fire at Chicago, Ill., Mar. 23. See report, page 237.

an unprotected doorway that had been made in the separating fire wall. Both sections of the 75 ft. by 150 ft. unsprinklered 1-story brick, wood-joisted building were involved when apparatus arrived.

Lodge Halls

Feb. 12, Emporia, Kan. Masonic Temple, et al. $570,500.

Lodge room, printer, offices. Ignition of gas leaking from a broken 4-inch main in the vicinity of a gas-fired furnace in the basement was believed responsible for fire that destroyed the unsprinklered 3-story brick, wood-joisted building. Ventilation shafts facilitated vertical spread. Several explosions occurred during the first half hour as gas continued to escape until the street was dug up, the main cut and plugged. No shut-off was provided outside the building. Among records destroyed were aerial maps and farm surveys, representing an estimated 40 man years of work in preparation.

Sept. 7, Atlanta, Ga. Masonic Temple, et al. $429,500.

Lodge hall, mercantiles. During remodeling operations on the fourth floor of the 105-ft. high 4-story brick, wood-joisted building, a carpenter discovered fire near the organ pipes in the balcony and immediately dispatched a helper to give the alarm. Attempts by the workmen to extinguish the blaze with extinguishers proved futile. Collapse of a domestic water tank on the roof of the structure weakened one wall, forcing firemen to leave the building and attack the flames from a safe location in the street. Gusty winds twisted and swayed the aerial ladders to such an extent that they could not be manned safely.

***Dec. 17, Wabash, Ind. Masonic Temple, et al. $300,000.**

Lodge hall and office building destroyed, city

Acme

Masonic temple fire, Atlanta, Ga., Sept. 7.

Six dwellings and two apartment houses were destroyed by fire that originated in a lumber yard at Fort William, Ont., Apr. 25.

hall and five mercantiles damaged. Fire originating in or near the not-cut-off basement furnace room had made great headway before discovery by an outsider at 11:15 A.M., Sunday. Flames spread up open stairways and an elevator shaft to all floors of the unsprinklered 5-story brick, wood-joisted building. Firemen quickly extinguished fire that broke out on six neighboring buildings.

Lumber Yards

***Jan. 17, Dixmoor, Ill. Hutchins Lumber and Storage Co. $500,000.**

One-fourth of 12-acre lumber yard, lumber mill, seven sheds and one dwelling destroyed; three dwellings damaged. Employees on discovering fire in a small sawdust shed quickly brought a yard hydrant stream into action, but despite their prompt action fire spread to the adjoining 1-story wooden mill. Wind carried flames through congested yard-stored lumber, sheds and to the dwellings on the perimeter of the yard. As a result of the fire the company moved to California.

***Mar. 20, Vacaville, Calif. Diamond Match Co. $250,000.**

Retail lumber yard. Fire that originated in a 1-story wooden storage shed had not made much headway when discovered by a policeman at 3:20 A.M. By the time the fire department had assembled and reached the scene, however, flames were beyond control, involving other congested sheds and yard storage.

***Apr. 2, Wilmington, Del. Wilmington Sash & Door Co., et al. $475,000. 1 killed.**

Lumber yard, mill work shop, lumber shed, 30 dwellings. Thirty-two buildings were destroyed or damaged by fire that started in a lumber yard located in a congested residential district. An 8-year-old boy "playing Indians" with a lighted broom soaked in kerosene set fire to the lumber yard which had no watchman protection over the weekend. A woman died of a heart attack suffered while being assisted from her home.

***Apr. 25, Fort William, Ont. Snelgrove-Evans Co., et al. $314,500.**

Lumber warehouse, yard-stored lumber, six dwellings, two apartments, eight trucks destroyed; three apartments, two dwellings damaged. When discovered at 3:43 A.M. flames were coming through the roof of the unsprinklered 2-story wooden warehouse. Driven by a 30-mile wind, fire spread through the lumber yard and ignited exposed residential buildings. Sparks ignited several roofs in the neighborhood. Had it not been for excellent water pressure which did not drop below 85 lbs. at the hydrants, the fire would have spread much farther in the opinion of fire officials.

***Nov. 1, Red Bank, N. J. Blaisdel Lumber Co., Satter Lumber Co., et al. $415,000.**

Lumber storage, video products, clothing

manufacturing. When discovered by a passerby at 2:00 A.M. fire involved an unsprinklered 1-story masonry and wood-joisted building in a lumber yard and a freight car near by. Firemen confined their efforts to protecting exposures, but were unable to save the adjoining lumber yard. Large stocks of lumber, paint and truck fuel tanks in the building intensified the blaze. An exposed sprinklered video products manufacturing building suffered water damage.

***Nov. 6, Stamford, Conn. Diamond Match Co. $250,000.**

Lumber yard, 3 dwellings destroyed, 4-story multiple occupancy building and 3 dwellings damaged. Fire set by boys playing with railroad flares and torpedoes spread through the lumber yard before a strong wind to exposed buildings on two sides of the yard before being controlled by 22 hose streams. On discovering the fire two employees attacked it with hand extinguishers before calling the fire department, thereby delaying fire department response until the fire was beyond control.

Nov. 23, Champaign, Ill. Thompson Lumber Co. $265,000.

Fire was beyond control in the 1-story wood-en building when firemen arrived, summoned by a passerby at 12:34 P.M. Large lumber stocks, paint and turpentine intensified the blaze in the combustible structure. Delayed detection and lack of automatic sprinklers were major factors in the large loss.

Military Camp

***Jan. 17, Camp Carson, Colo. United States Army. $3,040,500. 9 killed.**

8,000 acres brush land burned, 92 military barracks and warehouses destroyed, 16 damaged. A brush fire starting two miles away was driven by 44 to 80 mph winds over tinder-dry grassland, toward the camp. Nine of the professional fire fighters and volunteers were trapped by the fast spreading flames. Total floor area of buildings destroyed was 311,597 sq. ft. Forty to fifty feet separation existed between buildings. Although the huge fire-fighting force of 8,000 was responsible for saving most of the combustible buildings at the camp, the fire emphasized the need for disaster planning, organization and training on a community-wide scale, and adequate skilled leadership to utilize efficiently relatively unskilled volunteer forces.

A brush fire starting two miles from Camp Carson, Colo., Jan. 17, swept into the camp, destroying 92 barracks and warehouses. Nine fire fighters were killed.

Motion Picture Studio

***May 26, Burbank, Calif. Columbia Picture Corp.. $400,000.**

Outdoor sets, generator room, paint shop, carpenter shop. An area approximately 200 ft. sq. on which was erected structures, simulating office buildings, banks, theatres and other typical buildings used in motion picture production, as well as maintenance buildings and incidental structures, was swept by fire that originated in a carpenter shop. The night watchman first discovered the fire while in the guard house 1,000 ft. away at 1:46 A.M., 1 hour and 21 minutes after he had inspected the building of origin. Firemen did commendable work in preventing spread to other areas of similar congested wooden construction.

Motion Picture Theatres

Feb. 22, Taft, Calif. Hippodrome Theatre. $250,000.

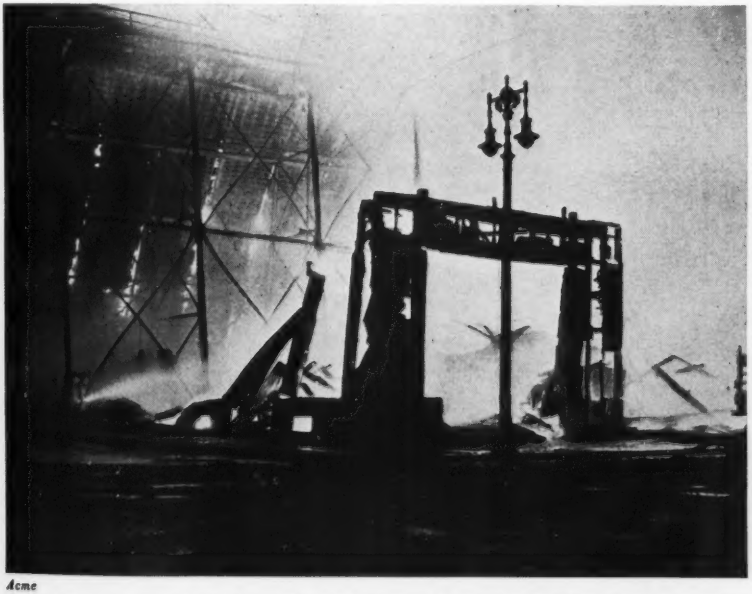
1,600 seat theatre with two balconies. Originating in the upper balcony, fire had made such headway when discovered by a policeman at 2:45 A.M. that firemen were able to make only a brief attack on fire from within before the balcony collapsed, injuring one of them. Blank walls prevented hose streams from reaching the fire until the unprotected steel-framed roof collapsed. The projection booth and equipment were undamaged.

***Mar. 10, Billings, Mont. Empire Theatre, et al. $302,000.**

Motion picture theatre, 50-room hotel, 3 stores, office. Fire originating in the basement of the unsprinklered 3-story building burned into a first floor closet off the theatre foyer where it was discovered by the manager at about 9:45 P.M. Employees fought the flames with hand extinguishers while a 16-year-old girl, the only usher, averted panic by calmly directing patrons to leave via a rear exit. The last six rows of seats were burning when the last person left. The alarm was given by a policeman, who noticed the crowd assembled at the rear. Guests of the 50-room hotel on the upper two floors fled through smoke-filled corridors before flames spread up stairs. An adjoining building suffered damage when fire entered through a hole in the party wall.

Oct. 26, Farmingdale, N. Y. Farmingdale Theatre. $275,000.

1,500 seat theatre. At 2:15 A.M., three hours after the last show ended, a passerby discov-



Acme

Outdoor sets used in filming motion pictures were destroyed at Burbank., Calif., May 26.

ered fire in the unsprinklered 1-story brick, wood-joisted building. The balcony where the fire originated was in flames and an exit door had been blown open by a fire-gas explosion before apparatus arrived.

Night Club

***Dec. 5, Dallas, Tex. The Greater Dallas Club. $300,000.**

Night club, stores, office. A balcony of a first floor store was the probable point of origin of fire that had burned through the ceiling into the second story night club of the downtown building before discovery by police at 3:07 A.M. Fire was confined for the most part to the second story of the unsprinklered 2-story brick, wood-joisted building, but collapse of the second floor caused heavy damage to first floor stores. Cracks in a fire wall were the apparent means of spread to the cockloft of an adjoining 2-story brick, wood-joisted office building.

Petroleum Production and Distribution

Jan. 11, near Elk City, Okla. Shell Oil Co. $500,000.

Drilling equipment, including 130 ft. derrick. During drilling operations which had reached a depth of 9,683 ft. the well backfired mud. Fire that broke out on the derrick floor was quickly put out, but due to failure of the automatic blowout preventer the flow of gas increased considerably and reignited. On Jan. 15, after all debris had been removed and the area wet down, the fire was "shot out" with 100 qts. of nitroglycerine. It reignited 4 minutes later, possibly because of the presence of hot metal, but the flow gradually decreased thereafter and the fire extinguished itself on Jan. 16.

***June 30, near Santa Maria, Calif. Sunray Oil Corp. $333,500. 2 killed.**

Fractionating towers, aboveground storage tanks. One employee was killed immediately and a second died later of burns suffered when a fractionating tower exploded at this 10-acre refinery. The explosion sprayed hot oil over an area of two acres, damaged other fractionating towers and set fire to 16 aboveground tanks of crude oil and asphalt. Effective fire fighting by county firemen and crews with foam equipment from neighboring refineries prevented ignition of additional exposed storage tanks. The fire was confined to approximately one acre.

***Oct. 1, Port Arthur, Tex. Texas Co. $750,000.**

Storage tanks. Fire destroyed 11 large storage tanks containing light oil, kerosene and gasoline charge stock. The roof of a small rundown tank blew off when water and hot stock came in contact, and flammable liquid was

Wide World

One June 30, an explosion at a fractionating tower at a refinery near Santa Maria, Calif., sprayed hot oil over an area of one acre.

blown out of the tank into the adjacent diked area. Vapors were ignited at a near-by pump house. Eleven tanks were destroyed and three others damaged within the single diked area.

Nov. 15, Port Arthur, Tex. Gulf Oil Corp. $500,000. 1 killed.

Refinery. Escaping gas in the pressure still area ignited at a fire box. Seven explosions and fire followed, injuring three employees, one fatally.

Oil Well

Dec. 4, near Pointe-a-la-Hache, La. Richardson and Bass. $300,000.

Drilling rig on barge. The rig was severely damaged when a well blew out and caught fire during drilling operations that had reached a depth of 11,681 ft. The sudden flow of gas is attributed to a choke line valve that had been worn out by an abrasive mixture of sand and high pressure gas. After the hole had bridged over shutting off most of the flow, the fire was extinguished by pumping water through an undamaged choke line.

Pier

Dec. 17, Brooklyn, N. Y. American Stevedores, Inc. $375,000.

Pier No. 46, containing comparatively small amount of merchandise — bagged coffee, refrigerators, electric motors, sheet and angle aluminum, electric switches. The superstructure of the pier, consisting of a single deck 500 ft. by 75 ft. steel framed, metalclad shed, was destroyed by fire that had almost complete possession of the structure when discovered at 4:30 A.M. by a watchman. No sprinklers or fire divisions were provided.

Prairie Fire

***Mar. 6, near Dumas, Tex. Dick Coon Range, et al. $500,000. 1 dead.**

115 square miles of range and farmland. Blustery 40 to 50 mph winds drove fire with incredible speed through tinder-dry grassland destroying barns, haystacks, hundreds of miles of fence and killing several cattle. One fireman lost his life when trapped by flames.

Railroad Trestles

May 7, New York (Jamaica Bay), N. Y. Long Island Railroad. $650,000.

Four-mile wooden trestle. An 1,800-ft.-long stretch of supporting piles and superstructure of the two-track over-water trestle was destroyed by fire that originated about ¼-mile from shore. Flames driven by a 25 mph wind were finally checked by firemen, who approached the blaze from both ends with equipment brought along the tracks by railcars. Shallow water prevented use of fireboats.

Wide World

Fire had almost complete possession of this unsprinklered and undivided pier at Brooklyn, N. Y., when discovered by the watchman.

Acme

Two railroad trestles were badly damaged by fire in 1950. This fire occurred May 7, at New York, N. Y. See report, page 243.

July 16, St. Albans, Vt. Central Vermont Railway. $250,000.

1¼-mile-long wooden trestle over water. Waste from a hot box on a freight car ignited creosoted ties at one end of the trestle, after which flames spread rapidly along ties and structural members before a stiff wind. Spread was stopped midway by opening the drawbridge, and the fire was extinguished by firemen using 1½-inch lines supplied by portable pumps.

Wide World

Big Rapids, Mich., Feb. 21.

Schools and Colleges

Feb. 20, Newtown Square, Pa. Ellis Country School for Girls. $447,000.

Offices, classrooms, laboratories, auditoriums, library. When discovered by a passing motorist at 2:58 A.M. fire had involved 60 per cent of the unsprinklered 2-story masonry, wood-joisted building. Fire originated in the basement and spread within air ducts, nonfirestopped walls and above false ceilings. Contents of nonfireresistive metal filing cabinets were destroyed.

***Feb. 21, Big Rapids, Mich. Ferris Institute. $291,000.**

Commerce building and Pharmacy building. A 25-minute delay by the janitor in giving the fire alarm as he attempted to extinguish fire in a pipe shaft with hand extinguishers permitted fire to spread through the shaft to the attic of the unsprinklered 3-story brick, wood-joisted Commerce building before apparatus arrived. Fire spread to the adjacent Pharmacy building through a connecting passageway.

Feb. 22, Princeton, N. J. Princeton University. $250,000.

Cyclotron vault in physics laboratory. An electric defect may have been the source of ignition of 800 gals. of cooling oil for magnets

of an 18 million volt cyclotron located in a 525 sq. ft. vault in the basement of the 3-story fire-resistive building. Since no automatic carbon dioxide flooding system was provided and the public fire department was not equipped to extinguish large oil fires, the fire burned within the concrete vault until foam could be obtained from the Naval Air Station at Lakehurst.

Mar. 1, Hazleton, Pa. Walnut Street School. $250,000.

Sixteen-room grade school. An overheated 30-inch metal smoke pipe connecting two boilers to the chimney was the cause of fire that destroyed the unsprinklered 2-story brick, wood-joisted building. At 5:00 A.M. the janitor discovered fire on the ceiling above the smoke pipe and extinguished the visible flame with buckets of water. He did not call the fire department, however, and 45 minutes later fire was discovered spreading within wooden partitions of the boiler room.

***Mar. 11, Rensselaer, N. Y. St. John's Academy. $500,000.**

High School, dwelling. Delayed detection was again the principal factor in the destruction of a school building. When neighbors were awakened at 1:50 A.M. flames were issuing from all windows of one wall of the unsprinklered 3-story brick, wood-joisted building. Origin was in the chemistry department on the second floor. A wall collapsed soon after apparatus arrived and fire spread to the adjacent wooden dwelling.

Mar. 15, Fort Worth, Texas. Carswell Air Force Base. $566,000.

Hangar used as gunnery school. An employee reporting for work at 7:02 A.M. discovered fire in a lean-to of the 12,600 sq. ft. unsprinklered 1-story wooden building. The alarm was not given until after an unsuccessful attack on the fire with hand extinguishers. The entire building was in flames when the Air Force Base Fire Department arrived. A B-36 type aircraft was removed from in front of the burning building before being damaged, and a wooden structure eight feet away was successfully protected. Spontaneous ignition of oily rags in a wooden box was the probable cause. Kerosene type solvent in an open bucket, film cement in quart containers and oxygen from ruptured lines intensified the fire.

***Mar. 21, North Cumberland, R. I. Our Lady of the Valley Monastery. $334,000.**

Dormitory, chapel, infirmary. Lack of adequate private protection for this group of buildings located in an area without public fire protection permitted fire to destroy the unsprinklered 3-story dormitory and adjoining chapel, and severely damage the near-by infirmary. On discovery at 10:00 P.M. occupants of the dormitory attempted to control the fire with first aid extinguishers and bucket brigades and called for help from surrounding towns when all hope of saving the building of origin was gone. By hauling water from hydrants more than a mile from the fire, firemen were able to save part of the infirmary and several smaller buildings.

Providence Journal-Bulletin

This monastery at North Cumberland, R. I., was located in an area without public protection, yet had not provided adequate private protection.

Mar. 22, Colorado Springs, Col. Colorado School for Deaf and Blind. $353,000.

Classroom building with auditorium and braille library. The wiring system for stage lights that had been injured by raising and lowering of the lights caused ignition of combustible material in the blind attic of the unsprinklered 3-story stone, wood-joisted school. Fire smoldered several hours before the odor of smoke was noticed by partially blind students in the yard at 10:35 A.M. Following fire drill procedure the 80 deaf students in the building marched out calmly. Braille books and maps were destroyed. Fire fighting was handicapped by the slate roof which eventually collapsed, by a defective hydrant, and by inadequate water from old small diameter private mains restricted by a metering device.

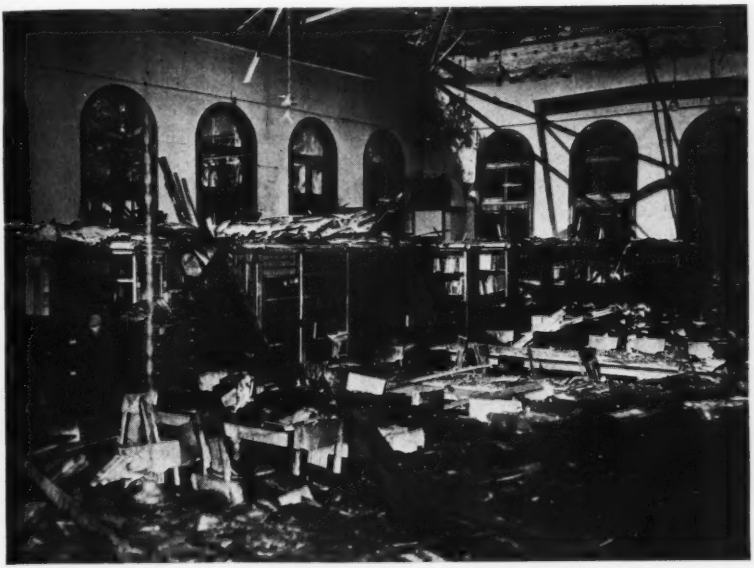
Apr. 13, near Camden, Ark. Fairview School. $300,000.

High school — auditorium, classrooms and cafeteria. Fire that destroyed the 1-story brick wood-joisted building originated in the basement chemical storage room. The watchman, patroling outside, smelled smoke at 6:00 P.M., but failed to realize its significance until his next round at 8:00 P.M. when conditions were much worse. Further delay in fire department notification occurred when the watchman summoned the superintendent to investigate the source of the smoke. When firemen were finally summoned the entire building was involved. Water from a partially filled 30,000-gal. tank, the only available source, gave out 6 minutes after apparatus arrived. Firemen confined their efforts to protecting exposed properties with water from an electric supply pump for the tank.

April 16, Winfield, Kan. Southwestern College. $298,000.

Richardson Hall — classrooms, laboratories, auditorium, office. In addition to the measurable loss caused by the destruction of the unsprinklered 3-story stone, wood-joisted building, was the intangible loss resulting from the destruction of a chemistry library, theatrical library, art collection, insect collection and records stored in filing cabinets. Fire originating in and confined to a basement, janitor's supply and chemical storage room when discovered by two students at 12:20 A.M., was fought by them with hand extinguishers until they were forced to flee and give the alarm. The door to the storage room was left open by them, allowing flames to spread rapidly through the basement and up a light well.

Two libraries, an art collection, insect collection and valuable records were destroyed at Winfield, Kan., April 16.



Ann Arbor News

Fire, June 6, at this classroom building at the University of Michigan, Ann Arbor, is reported to have been incendiary in origin.

June 6, Ann Arbor, Mich. University of Michigan. $637,000.

Classroom building. A teacher is reported to have confessed setting fire on the second floor that destroyed the 3-story masonry, wood-joisted building. Lack of sprinklers, detection equipment or fire walls and the presence of a large undivided attic were the primary reasons for the large loss. Among valuable records lost was most of a 50,000 item library of the Bureau of Government on the third floor. Collapse of the library floor sent burning books and pamphlets into the classroom below.

Aug. 28, Christopher, Ill. Christopher High School. $365,500.

High school. Fire originated in a 6 ft. concealed space above the auditorium section of the 3-story brick, wood-joisted building and was through the roof before discovery by an outsider at 9:00 P.M. The only available water supply was from two hydrants, one 6 blocks away fed by a 4-inch main and the other at the school fed by eight 1-inch taps (approximately equivalent to a 2½-inch main). Firemen salvaged some school supplies from the basement.

Oct. 26, Rhinecliff, N. Y. Cardinal Farley Military Academy. $360,000.

Classroom, offices, chapel, sleeping quarters, dining facilities. Fire had involved the entire attic of the 58-room 4-story stuccoclad and

Acme

Military Academy, Rhinecliff, N. Y.

stone converted mansion before smoke was detected at 6:20 P.M. The 45 students and eight faculty members who were at dinner on the first floor escaped without injury. Firemen were unable to save any part of the structure, principally because of inadequate water. A 2-inch main supplied the four private hydrants around the building. Additional water was eventually pumped up a long hill to the scene from a lake ½-mile away.

Nov. 22, Knox County, Tenn. Gibbs School $500,000.

Elementary and High school for 600 pupils. Fire had made great headway in the unsprinklered 24,600 ft. 1-story brick, wood-joisted building when discovered by a neighbor at 4:00 A.M. Pumpers from two communities responded but with no hydrants or static water supply available, confined their efforts to saving a new gymnasium 20 ft. away, using booster lines.

Shipyard

***May 22, Vancouver, B. C. B. C. Packers, Ltd. $354,000.**

Marine parts warehouse, one fishing craft destroyed, seven fishing craft damaged. Fire originating on the second floor of the unsprinklered 200-ft. long wooden warehouse, and beyond control when discovered by the watchman at 1:00 A.M., destroyed the building and spread with the aid of a 30 mph wind to eight seiners tied up at an adjacent pier. Outside sprinklers manually operated by the watchman protected a wooden building 30 ft. from the fire.

Stables

June 9, near Hinsdale, Ill. Emil Denemark Stables. $423,000. 1 killed.

Race horse breeding. An employee suffocated while attempting to save 17 thoroughbred horses trapped in the 1½-story wood building. When lightning struck the unrodded building flames spread rapidly, due to the hay storage and the large open doors, and involved most of the building when firemen responded to an alarm at 10:20 P.M. Ample water was supplied by six cisterns located around the structure. Firemen used a portable pump at each of these cisterns to keep the booster tanks on fire equipment supplied. Their first efforts to attempt the rescue of the stable hand, trapped in the building, were unsuccessful because of the delayed alarm. The fire was first reported by a neighbor a quarter-of-a-mile away.

Total "Miscellaneous" Losses: $51,656,000. 15 killed.

Knoxville News

Delayed detection and lack of water for fire fighting were notable factors in the destruction of this school at Knox County, Tenn., Nov. 22.

Transportation

Aircraft

The following list of aircraft accidents involving fire include only those occurring in Canada, the United States and Hawaii. U. S. and Canadian aircraft fire losses occurring in other countries are not included. Information on military aircraft accidents is normally classified by the service affected and therefore it has not been possible to secure complete data on such accidents.

Feb. 13, Queen Charlotte Sound, B. C. U. S. Air Force, B-36. $1,500,000. 5 killed.

Three engines on fire in flight followed by crash. Twelve crew members parachuted to safety but five were lost.

Feb. 15, near Great Falls, Mont. U. S. Air Force, B-29. $750,000. 8 killed.

Accident on take-off followed by fire. Eight crewmen killed, seven escaped.

***Feb. 22, El Segundo, Calif. U. S. Air Force, XF-89. $500,000. 1 killed.**

Engine fire and explosion in flight followed by crash and fire. Part of aircraft landed within 150 ft. of 500,000 barrel fuel oil reservoir and fire spread to it. House also fire damaged. Pilot saved by ejection seat operation, but technician aboard killed.

Feb. 24, near Dayton, Ohio. U. S. Air Force, B-45. $500,000. 3 killed.

Four-engine jet crashed in flames. One crewman reported to have parachuted.

***Mar. 7, Minneapolis, Minn. Northwest Airlines, 2-0-2. $375,000. 15 killed.**

Aircraft struck flagpole while attempting a landing and crashed into dwelling. Fire ensued immediately. All aboard the aircraft were killed plus two children asleep in the dwelling.

Mar. 12, near Tampa, Fla. U. S. Air Force, B-29. $750,000.

Crash followed by fire at landing. No fatalities.

Mar. 23, near Gilda Bend, Ariz. U. S. Air Force, B-50. $850,000. 12 killed.

Explosion in flight. Only two of fourteen crewmen parachuted to safety.

April 5, Keehi Lagoon, Hawai. U. S. Navy, "Mars." $5,000,000.

Engine fire in flight followed by emergency landing, fire and explosion. All crew members escaped.

April 7, near San Antonio, Texas. U. S. Air Force, B-29. $750,000.

Crashed and burned in open country. Six in crew escaped.

April 11, near Albuquerque, N. M. U. S. Air Force, B-29. $750,000. 13 killed.

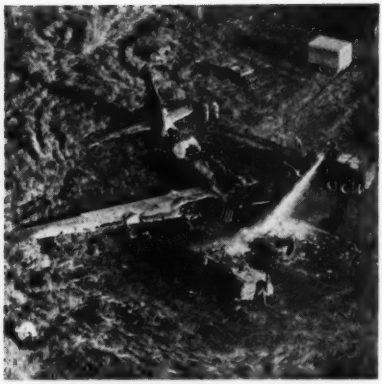
Aircraft crashed and burned immediately after take-off. All thirteen aboard killed.

April 26, near Hartsville, S. C. U. S. Air Force, C-54. $500,000.

Fire in flight followed by emergency landing and fire. All four crewmen escaped safely.

Acme

The total loss of the 72½-ton, $5,000,000 Mars in Keehi Lagoon, Hawaii, indicated aircraft design and protection shortcomings since a fire in the right inboard engine was allowed to spread to the 6,000-gallon fuel tanks causing a severe explosion.



Wide World

Four perished but eight escaped from this crash fire near the Carswell Air Force Base, Fort Worth, Tex., Aug. 14, 1950.

May 14, Winnipeg, Man. Royal Canadian Air Force, Lancaster Bomber. $500,000.

Accident during take-off followed by fire. Eleven crewmen escaped safely.

June 1, near Roswell, N. M. U. S. Air Force, B-29. $750,000. 3 killed.

Undisclosed in-flight difficulty followed by crash and fire. Four of crew of seven parachuted safely.

June 22, near Bedford, Va. U. S. Navy, AJ-1. $500,000. 3 killed.

Fire in flight followed by crash and fire.

July 13, Mason, Ohio. U. S. Air Force, B-50. $850,000. 16 killed.

Possibly engine fire in flight followed by crash and fire. Fatal to all aboard.

July 13, Crook National Forest, Ariz. U. S. Air Force, B-50. $850,000. 1 killed.

Engine fire and explosion in flight followed by crash and fire. Six crewmen parachuted safely; three listed as missing.

***Aug. 5, near Fairfield-Suisun Air Base, Calif. U. S. Air Force, B-29. $800,000. 19 killed.**

Bomb loaded aircraft crashed soon after take-off near trailer camp and burst into flames. Flames communicated to trailer camp. Approximately ten mintes after the crash, the bombs exploded, killing seven fire fighters. Twelve of the twenty flight crew aboard perished. Sixty persons were injured.

Aug. 14, near Fort Worth, Tex. U. S. Air Force, B-29. $750,000. 4 killed.

Emergency landing followed by crash and fire. Eight crewmen escaped.

Sept. 1, near Parsons, Tenn. U. S. Air Force, C-119. $250,000. 7 killed.

Explosion in flight followed by crash and fire. Two injured crewmen escaped.

Sept. 21, near Goose Bay, N'w'f'l'd. U. S. Air Force, B-50. $850,000.

Engine fires in flight followed by crash and fire. Sixteen aboard parachuted to safety.

Oct. 6, near Suffolk, Va. U. S. Air Force, B-45. $500,000. 2 killed.

Fire and explosion in flight followed by crash. Fatal to both crewmen aboard.

Oct. 13, near Almelund, Minn. Northwest Airlines, 2-0-2. $300,000. 6 killed.

Emergency landing followed by crash and fire. All aboard were killed.

Nov. 7, near Homestake, Mont. Northwest Airlines, 2-0-2. $300,000. 22 killed.

Crash in mountains followed by fire. Fatal to all aboard.

Nov. 13, near Deale, Md. U. S. Navy, AJ-1. $500,000.

Engine fire in flight followed by crash and fire. All three crewmen aboard parachuted to safety.

Nov. 16, near Silnakya, Ariz. U. S. Air Force, B-29 and B-50. $1,600,000. 13 killed.

A B-29 and a B-50, converted to a flight refueler, crashed in flames in the Arizona desert. Eye-witness indicated explosion during refueling operation when aircraft collided. Ten of 23 crewmen aboard both aircraft survived.

Nov. 22, near Cleburne, Tex. U. S. Air Force, B-36. $1,500,000. 2 killed.

Emergency landing followed by crash and fire. Fourteen of sixteen aboard parachuted to safety.

Dec. 13, near Sydney, N. S. Swiss Air Lines, DC-4. $500,000.

Struck object during landing attempt, fire resulted. Thirty-one escaped uninjured.

Ships

Jan. 20, off Chalmette, La. M.S. *Heimvard.* $400,000.

4,851-ton freighter, no cargo. While proceeding upstream a leak developed in the packing or a fracture in the fuel line, near ejector on No. 7 cylinder, spraying oil on the exhaust manifold. The fire was fought with foam extinguishers, but spread to a fuel tank which exploded. The vessel was beached on discovery of the fire. The hull plates on the starboard

The S.S. *Quebec* was the second Canadian steamer to be destroyed by fire within a year. This vessel made port at Tadoussac, Quebec, permitting all but seven persons to escape.

side buckled and part of the bridge and upper decks were carried away by the explosion. No one was injured.

Steamship

Aug. 14, St. Lawrence River (Tadoussac), Quebec. S.S. *Quebec*. $1,000,000. 7 killed.

Another Canadian river steamer was gutted by fire within a year of the tragic S. S. *Noronic* disaster.** The fire aboard the *Quebec* was discovered at about 5:30 P.M. in an unsprinklered upper deck, while the ship was cruising the St. Lawrence. The vessel was able to make port at Tadoussac, permitting some 540 persons to escape to safety. Seven are known to have perished on the 350 ft. ship. Fire-spread through the wood superstructure was so serious the entire vessel was scrapped following final extinguishment. Sprinklers were installed in substantial portions of the lower two decks, but the upper three decks were not so protected, although the latter decks did have automatic fire detection equipment installed. Complete reports by the government Board of Inquiry are not yet available, but the fire may have been of incendiary origin.

Oct. 10, 360 miles S. E. of Halifax, N. S. S.S. *Monte Inchorta*. $500,000.

3,350-ton freighter. When 4½ days outbound from New York fire was discovered in No. 2 lower hold containing drums of soybean oil, automobiles, machinery, tires, wax and general cargo. On Oct. 11th, the ship reached an anchorage in Halifax Harbor. Navy fire crews took over, when their attempts to control the fire proved unsuccessful, the vessel was finally docked. Water was then pumped into the hold for approximately twelve hours. Heat and flames ignited combustible storage and ruptured drums of soybean oil in the 'tween-decks above the hold, fire burned through a wooden bulkhead to a coal bunker, and heat penetrated the steel deck to ignite combustible furnishings in the saloon above. The large amount of water necessary to extinguish the fire in the hold floated burning soybean oil to inaccessible areas and finally submerged the bow of the vessel.

Dec. 24, off New Orleans, La. *Esso Baltimore*, et al. $350,000.

Oil tanker, three oil barges. While proceeding downriver, the tanker carrying 92,000 barrels of oil collided with a tow of barges which from some as yet unexplained reason crossed her bow. Friction sparks were the apparent cause of the fire that immediately enveloped the tanker and barges. Although it was at first feared that burning oil would spread under New Orleans wharves, the fire was confined to the vessels and their immediate area. Original estimate of $3,500,000 damage was grossly exaggerated. The tanker will be repaired for approximately $200,000.

Total Transportation Losses: $25,775,000.
162 killed.

**See January 1950 NFPA *Quarterly*.

TABLES — LARGE LOSS FIRES OF 1950

Table No. 1
FIRE CASUALTY STATISTICS

Deaths	Manufacturing	Storage	Mercantile	Habitational	Miscellaneous	Transportation	Total
Occupants	16	0	12	10	5	155	198
Firemen	1	0	0	0	10	7	18
Total	17	0	12	10	15	162	216
Injuries							
Occupants	55	0	9	43	21	62	190
Firemen	77	105	90	42	65	0	379
Outsider	0	0	0	0	0	63	63
Total	132	105	99	85	86	125	632

Table No. 2
FIRE DETECTION METHODS

	Manufacturing	Storage	Mercantile	Habitational	Miscellaneous	Total	Per Cent
Occupant (employee)	36	6	9	8	20	79	37.1
Outsider (passer-by)	26	10	15	2	25	78	36.6
Watchman (private)	14	4	1	1	5	25	11.7
Police (public or private)	0	1	2	0	5	8	3.8
Explosion	5	1	2	0	2	10	4.7
Automatic detection equipment	0	1	0	0	0	1	0.5
Automatic sprinkler equipment	2	0	0	0	0	2	0.9
Forest fires	0	0	0	0	8	8	3.8
Unknown	1	0	0	0	1	2	0.9
Totals	84	23	29	11	66	213	100.0

Table No. 3
LOCATION OF PROPERTY BY POPULATION CATEGORIES

	Manufacturing	Storage	Mercantile	Habitational	Miscellaneous	Total	Per Cent
0-500	5	0	0	2	1	8	3.8
501-1,000	2	1	0	0	0	3	1.4
1,001-5,000	23	3	3	0	12	41	19.2
5,001-10,000	11	0	3	1	4	19	8.9
10,001-20,000	8	2	6	2	9	27	12.7
20,001-50,000	5	2	6	2	11	26	12.2
50,001-100,000	4	3	5	1	0	13	6.1
Over 100,000	13	7	5	3	13	41	19.2
Outside but city protected	9	2	1	0	5	17	8.0
Outside and unprotected	4	0	0	0	3	7	3.3
Government Reservation	0	3	0	0	8	11	5.2
Total	84	23	29	11	66	213	100.0

Table No. 4
CONSTRUCTION

	Manufacturing	Storage	Mercantile	Habitational	Miscellaneous	Total	Per Cent
Fire-resistive	2	2	2	0	3	9	4.2
Steel frame, metalclad	6	0	0	0	3	9	4.2
Steel frame, masonry	6	1	0	0	1	8	3.8
Heavy timber	2	0	0	0	0	2	1.0
Masonry and wood	30	11	23	8	28	100	46.8
Wood frame, metalclad	9	5	0	0	0	14	6.6
All wood	23	4	3	2	11	43	20.2
Mixed	6	0	1	1	2	10	4.7
Not a building	0	0	0	0	18	18	8.5
Total	84	23	29	11	66	213	100.0

Table No. 5

PRINCIPAL STRUCTURAL DEFICIENCIES INFLUENCING FIRE SPREAD

	Manufacturing	Storage	Mercantile	Habitational	Miscellaneous	Total
Horizontal Spread						
Inadequate Fire Limitation:						
Insufficient fire division walls	59	10	10	7	25	111
Unprotected doorways	7	2	3	1	6	19
Large undivided attic	1	1	1	1	11	15
Special hazard area not cut off	6	0	2	0	4	12
Large undivided basement	0	0	3	1	5	9
Substandard fire division partitions	1	2	2	1	2	8
Fire door not closed or blocked open	4	2	0	0	0	6
Substandard protected openings	3	0	0	0	0	3
Unprotected stock conveyor openings	0	0	0	0	1	1
Fire Wall Ineffective:						
Poorly constructed	0	2	3	0	0	5
Wood floor joists through fire wall	1	1	1	0	0	3
Lack of adequate parapet	2	0	0	0	0	2
Exterior Wall Collapse	1	2	2	0	5	10
Nonfirestopped Horizontal Concealed Spaces	3	0	2	1	4	10
Spread Via Horizontal Air-Conditioning Ducts	0	0	2	0	1	3
Vertical Spread						
Vertical Openings:						
Open stairwells	20	5	19	9	18	71
Open elevator shafts	9	6	0	3	3	21
Spread via stock conveyors	6	0	0	0	2	8
Spread via opening around pipes	1	0	0	0	3	4
Spread via machinery shaft openings	3	1	0	0	0	4
Spread via vertical air-conditioning ducts	0	0	1	0	1	2
Structural Collapse						
Roof collapse	7	5	5	4	13	34
Floor collapse	1	1	4	3	5	14
Nonfirestopped Vertical Concealed Spaces	2	0	3	4	4	13
Interior Finish and Insulation						
Highly combustible interior finish	5	1	5	0	3	14
Asphalt-coated metals	5	0	0	0	0	5
Oily floors or walls	4	0	0	0	0	4
Combustible insulation in wall or floor	2	0	0	0	1	3
Spread to Exposures						
Structural Weaknesses:						
Inferior combustible construction	18	5	5	1	14	43
Ordinary glass windows exposed	2	1	3	0	1	7
Poorly constructed party wall	0	1	1	2	2	6
Interconnecting passageways or conveyors	6	1	1	0	2	10
Wood shingles	1	0	0	0	1	2
Inadequate Separation:						
Structures unnecessarily close together	14	4	0	0	2	20
Congested built-up area	2	2	4	1	10	19
Outdoor storage congested	3	0	0	0	6	9

Table No. 6

PRINCIPAL PRIVATE PROTECTION DEFICIENCIES AND HANDICAPS

	Manufacturing	Storage	Mercantile	Habitational	Miscellaneous	Total
Automatic Sprinklers						
No sprinkler protection*	63	23	28	10	45	169
Explosion damaged system	5	0	0	0	0	5
Inadequate water supplies for sprinkler demands and fire department operations	3	0	0	0	0	3
Partial protection, origin in non-sprinklered area	1	0	0	1	0	2
Floor collapse damaged system	1	0	0	0	0	1
Hazard of occupancy too severe for sprinkler equipment installed	1	0	0	0	0	1
Water shut off for alterations and repairs	0	0	1	0	0	1
Unsupervised valve to water supply closed	1	0	0	0	0	1
Sub-standard system	1	0	0	0	0	1
Gravity tank empty	1	0	0	0	0	1
Automatic Detection Equipment						
No automatic detection equipment (excluding detection feature of automatic sprinkler equipments)*	63	21	24	11	44	163
Detection equipment operated but fire beyond control when manual fire fighting commenced	1	1	0	0	0	2
Watchman Service (non-operating properties)						
No watchman service*	18	18	22	7	38	103
Watchman failed to detect fire promptly	14	2	1	2	3	22
Non-standard watchman service	3	0	1	0	2	6
Watchman patrol outside of building only and detection delayed	0	1	0	0	1	2
Watchman fought fire, delayed alarm	1	1	0	0	0	2
Other watchman failures	2	0	0	0	0	2
Fire Brigade						
Fire brigade ineffective	8	1	1	1	2	13
No organized fire brigade when needed*	6	2	0	0	0	8
First Aid Equipment						
Fire not controlled by extinguishers used	14	2	1	0	8	25
Standpipe and Hose Systems						
Fire too advanced at discovery	14	1	0	0	1	16
Use not effective	15	0	0	0	0	15
Special Extinguishing Systems						
Not available to protect special hazard	3	0	0	0	3	6
Not effective although available	1	0	0	0	0	1

*Includes only cases where the protection would have been reasonable and economically practicable.

Table No. 7

PRINCIPAL FEATURES OF BUILDING CONTENTS

	Manufacturing	Storage	Mercantile	Habitational	Miscellaneous	Total
Flammable Liquids						
Under 20°F. Flash Point	10	1	4	0	9	24
Between 20°F. and 80°F. Flash Point	15	1	0	0	6	22
Between 80°F. and 200°F. Flash Point	6	0	2	0	1	9
Over 200°F. Flash Point	7	1	2	0	3	13
In drums, cans, etc.	12	1	2	0	6	21
In above-ground tanks	2	0	1	0	4	7
In automobile or aircraft tanks	0	0	0	0	3	3
Escape from industrial devices	9	0	0	0	2	11
In oil stove, furnace, salamander, etc.	0	0	1	0	0	1
Leak from under-ground tank	1	0	0	0	0	1
Compressed Gases Involved						
Liquefied petroleum gases	1	0	2	2	0	5
Ammonia	1	3	0	0	0	4
Acetylene	2	1	0	0	0	3
Others	2	0	1	0	0	3
Natural Gas Line Rupture or Leak	1	0	1	0	4	6
Grains, Flour, Other Powdered Materials						
Grain, flour, etc.	7	2	1	0	0	10
Wood dust	9	0	0	0	0	9
Other dusts	5	1	0	0	0	6
Ordinary Combustible Materials						
Heavy Storage in single fire area	10	11	13	1	9	44
Oil-soaked materials	6	0	0	0	0	6
Poor stock subdivision	1	0	2	0	2	5
Inadequate window clearance	1	1	0	0	0	2
Stock stored to ceiling	0	2	0	0	0	2
Burrowing fire in stock	0	1	0	0	0	1
Water swelling materials	1	0	0	0	0	1
Inadequate wall clearance	0	0	1	0	0	1
Christmas decorations	0	0	1	0	0	1
Housekeeping Conditions Poor	6	1	1	0	4	12
Records Not Safeguarded	5	1	1	0	5	12

Table No. 8

PRINCIPAL HUMAN FACTORS

	Manufacturing	Storage	Mercantile	Habitational	Miscellaneous	Total
Occupants fight fire, delay alarm	9	4	2	2	10	27
Observers call police instead of fire department	2	0	2	1	2	7
Occupants investigate source of smoke or heat, delay alarm	0	0	0	1	1	2
Bystanders fail to call the fire department promptly	1	0	0	0	0	1

Table No. 9.

PRINCIPAL PUBLIC FIRE DEPARTMENT DEFICIENCIES AND HANDICAPS

	Manufacturing	Storage	Mercantile	Habitational	Miscellaneous	Total
Fire Department Deficiencies						
Insufficient equipment	38	8	11	3	23	83
Local F. D. required mutual aid	31	8	0	0	0	39
Mutual aid not effective	9	0	3	1	6	19
Equipment breakdown	2	0	2	0	5	9
Inadequate pumper capacity	3	0	1	0	3	7
Mutual aid travel time a handicap	5	0	1	0	0	6
No fire department locally available	4	0	0	1	0	5
No local F. D., outside F. D. called	4	0	0	0	0	4
Lack of special service equipment	1	0	0	0	3	4
Lack of aerial ladders	0	0	2	1	1	4
Fire Department Manpower						
Insufficient manpower	29	7	8	3	18	65
Manpower not properly trained	0	2	2	0	2	6
Fire Department Response to Alarm						
Running distance long	0	0	0	0	5	5
Volunteers slow in organizing	0	1	1	0	3	5
Icy or slippery roads	2	0	0	0	0	2
Fire Department Water Supplies Deficiencies						
Inadequate hydrant volume for hose streams	9	2	2	1	9	23
No established underground supply	5	1	0	2	8	16
Inadequate volume for automatic sprinklers and hose streams	3	0	0	0	5	8
No static water supply source	2	0	0	1	5	8
Inadequate fire hydrants	6	1	0	0	0	7
Fire pump failed during fire or power supply. interrupted	5	0	0	0	1	6
Hydrants defective or frozen	3	0	0	0	1	4
Inadequate water pressures	2	1	0	0	0	3
Static source	0	0	0	1	2	3
Hydrants too close to building	1	0	1	0	0	2
Weather Conditions						
High or adverse winds	14	7	1	2	12	36
Extreme cold, snow or ice	5	0	6	3	4	18
Extreme drought conditions	0	0	0	0	5	5
Character of Fire Behavior						
Heavy smoke conditions	4	4	6	2	8	24
Explosion during fire	13	3	2	2	0	20
Explosion preceded fire	7	0	2	0	3	12
Explosion at start of fire	2	0	0	0	6	8
Toxic fire gases or vapors	2	3	0	0	0	5
Access Impediments						
Fire department forced to concentrate on protecting exposures	34	14	12	1	23	84
Access impeded by lack of venting facilities	2	1	1	0	2	6
Access impeded by locked, blocked or jammed doors or windows	1	1	0	0	2	4
Access impeded by congested buildings	1	0	0	0	2	3
Access impeded by blank walls	1	1	0	0	0	2
Access impeded by electric wires	0	1	1	0	0	2
Access impeded by height of building	0	0	0	0	1	1
Access impeded by outdoor storage	0	0	0	0	1	1
Access impeded by railroad tracks	1	0	0	0	0	1
Access impeded by body of water	0	0	0	0	1	1
Other Factors						
Windowless building	1	1	1	0	3	6
Flowing flammable liquids	4	0	0	0	2	6
Leaking gas mains or pipes	2	0	1	0	1	4
No basement entrance	0	0	2	0	0	2

FOUR WAYS AUTOMATICALLY PROTECTED

SPRINKLER SUPERVISORY and WATERFLOW ALARM

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INDUSTRIAL PROCESS SUPERVISION

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proven by more than 30 years of alert, reliable service in guarding private homes, public buildings, and manufacturing plants, is

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The unfailing system with the Patented Release Key that prevents "cold flow" — action without fire. Insures snappy, dependable action in case of fire.

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Made in a variety of types that enables you to choose *the best type for your special need.*

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Main Office and Plant
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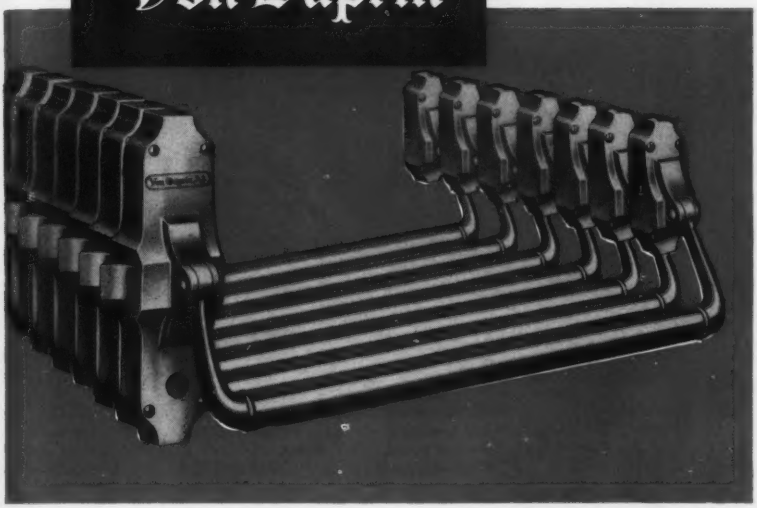
(Representatives in principal cities of United States, Canada and Foreign Countries)

"On Guard at Independence Hall Since 1921"

Von Duprin



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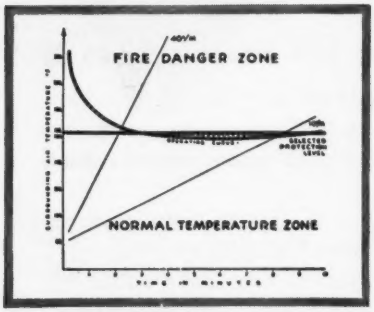
NOW...the most sensitive fire detector adds eye appeal

NEW FENWAL DETECT-A-FIRE horizontal model combines smart design with full protection for ordinary locations. Its temperature range extends to 325°F for release (type 20) application, and alarm (type 21) application.



POSITIVE RESPONSE of Fenwal DETECT-A-FIRE unit leaves no unprotected zone, eliminates false alarming.

No longer do you have to sacrifice protection or tolerate false-alarming in locations where appearance counts. The unobtrusive, functional design of the new DETECT-A-FIRE horizontal unit blends readily with any decorative styling. Yet look at the protection it gives. Unlike fixed temperature detectors, there is no unprotected zone. Unlike rate-of-rise detectors, there are no false alarms or missed alarms. DETECT-A-FIRE horizontal units come in alarm and release types with temperature settings up to 325°F. To get complete details, use the coupon below.

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DETECT-A-FIRE

combines Fixed-Temperature Response with Rate-of-Rise Compensation for Instant Alarm

SENSITIVE...
but only to heat

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In The Background Till Fire Strikes

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3% Aer-O-Foam® Liquid Proved Best by Actual Test

Aer-O-Foam snuffs out flammable liquid fires with a blanket of foam, quickly and efficiently. And to make it more economical than ever to use, the makers of Aer-O-Foam Liquid offer this product in 3% concentrated form. Here's what that means to you:

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In 3% or regular 6% form, there's no better foam liquid than Aer-O-Foam.

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Here's how 3% Aer-O-Foam gives better performance

	Foam Expansion at 70°F. (Gallons of foam per gallon of solution)	Minimum Operating Temperature*, 0°F.	FIRE TEST in accordance with nationally recognized standards				
			Coverage (Minutes)	Control (Minutes)	Extinguishment (Minutes)	Vapor Sealing Ability (Minutes)	Burn-Back Area** (Inches square)
3% Aer-O-Foam Liquid	10.25	0	0.80	1.66	2.25	20.0	10
Brand "Y"	9.00	6	1.33	4.00	4.33	6.5	19
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*Temperature below which foam liquid viscosity increases so that pick-up rate is too low

**A six-inch square hole is cut in blanket, reignited and permitted to burn for five minutes. The extent of increase of exposed surface is then measured.

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Headquarters for Foam Fire Protection

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OF BLAW-KNOX CONSTRUCTION COMPANY
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Offices in Principal Cities

BLAW-KNOX FIRE PROTECTION SYSTEMS

Sign of Dependable Fire Protection

the HORTON WATERSPHERE

This 100,000-gal. Horton Watersphere maintains gravity water pressure in the automatic sprinkler system at the Schwitzer - Cummings Company's plant at Indianapolis, Ind. The plant contains 400,000 sq. ft. of floor space, all of which is protected by an automatic sprinkler system.

The Watersphere, which is 100 ft. to the bottom, provides the secondary source of water supply for the sprinkler system. In case the pressure of the primary water supply is not adequate, the Watersphere can be relied upon to provide immediate gravity water pressure to quench the flames before they have a chance to gain headway.

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Write our nearest office for quotations on Horton elevated tanks.

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PLANT SAFETY WITH EVER PRESENT PROTECTION

GLOBE
SPRINKLERS
FIREMEN EVERY 10 FEET
Carelessness or indifference. Nearly all FIRES are the result of carelessness. Install GLOBE Automatic Sprinklers to stop these FIRES. That some plant owners WON'T do this isn't carelessness, it's indifference ... and that's worse.
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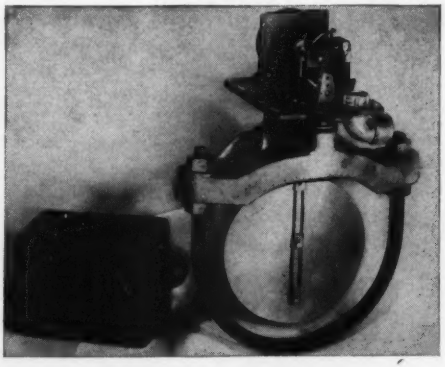
THEY PAY FOR THEMSELVES



5-inch size shown above. To install simply drill hole in pipe.

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Waterflow Alarm Device is approved by both the Factory Mutual Laboratories and Underwriters' Laboratories, Inc. In hundreds of installations it has proved to be the ideal alarm device for sprinkler systems.

- **Made in all sizes from 2½" to 8"**
- **It is positive in operation**
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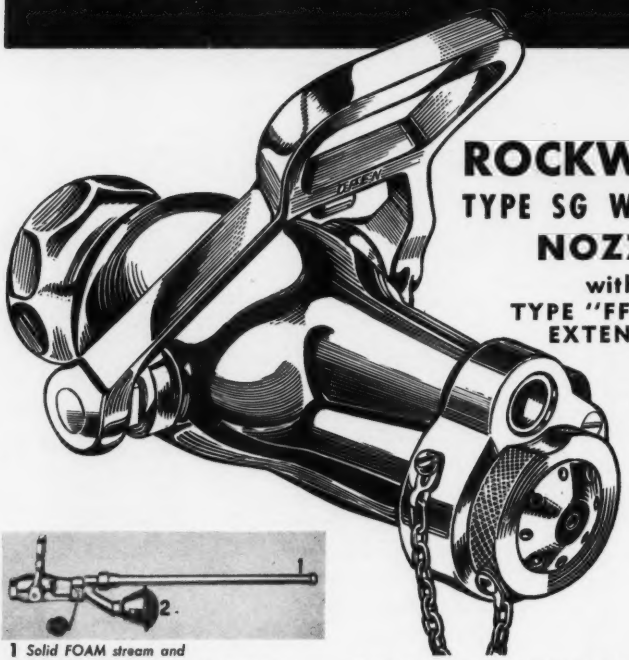
SIMPLIFIED FIRE EQUIPMENT

A REAL ALL-PURPOSE NOZZLE!



ROCKWOOD TYPE SG WaterFOG NOZZLE with TYPE "FF" FOAM EXTENSION

1 *Solid FOAM stream and*
2 *FogFOAM from "FF" FOAM extension inserted in type SG WaterFOG Nozzle.*

3 *High Velocity WaterFOG.*

4 *Straight water stream.*

5 *Low Velocity WaterFOG from extension applicator.*

Latest type Rockwood "FF" FOAM Extension unit makes possible *5 different kinds of discharge* from only one type SG WaterFOG Nozzle — (1) solid FOAM stream (2) FogFOAM (3) high velocity WaterFOG (4) solid water stream (5) low velocity WaterFOG.

This new type "FF" FOAM extension combined with our type SG WaterFOG Nozzle will handle any type of fire in ordinary combustibles, flammable liquids or materials that can be extinguished with water alone or water mixed with FOAM Liquid. These "FF" extension units are available for use with Rockwood Nozzles on ¾", 1" or 1½" fire hose lines.

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Portable Fire Protection Division
ROCKWOOD SPRINKLER CO.
56 HARLOW STREET WORCESTER 5, MASS.

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Tremendous advances in fire protection have been made in every branch of the fire engineering field since the Ninth Edition of the Handbook in 1941. The Tenth Edition contains new and up-to-date information, a good deal of which represents developments that were made during the war — in industry, in fire prevention and in fire extinguishment.

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plain end pipe couplings

(Listed under re-examination service by the Underwriters' Laboratories, Inc.)

They cut coupling costs way down!

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Rolagrips save space, too, are ideal for "tight and awkward" spots where there's little room for flange clearance. They also cut maintenance costs because each Rolagrip joint becomes a flexible union, easy to dismantle for repair or clean-out.

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Famous Rolagrips are now available in sizes 1½"–12". You can use them with any steel or wrought iron plain-end pipe, new or used. You'll use each Rolagrip over and over again, because Rolagrips are *reclaimable!*

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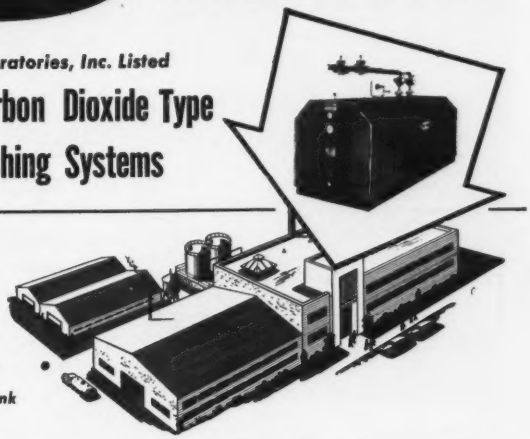

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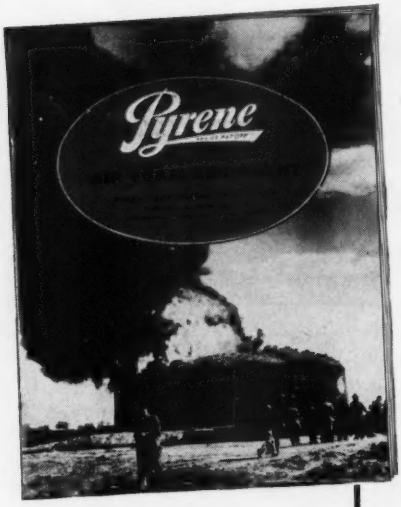


VALUABLE AIR FOAM REFERENCE CATALOG

FREE

TO FIRMS WITH FLAMMABLE LIQUID FIRE HAZARDS

Illustrates and describes air foam equipment for every type of oil hazard

Pyrene* Air Foam is the finest fire protection yet devised for oil fire hazards. It extinguishes surely and speedily—and, in most instances, can be operated by one man. The largest oil test-fire in history was killed in 4 minutes 2½ seconds with Pyrene Air Foam! Yet, with all its advantages, Pyrene Air Foam is low in installation cost, and offers important savings in maintenance expense. It is available in the most complete line of portable, fixed, and mobile units, for any size hazard. Every firm which must cope with the danger of oil fires will find this catalog a primary reference work. Send for your copy today...without any obligation, of course.

*T.M. Reg. U.S. Pat. Off.

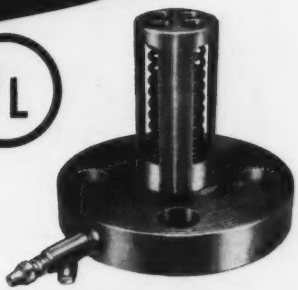
Pyrene
REG. U.S. PAT. OFF.
AIR FOAM

PYRENE MANUFACTURING CO.
582 Belmont Ave., Newark 8, N.J.
Affiliated with C-O-Two Fire Equipment Co.

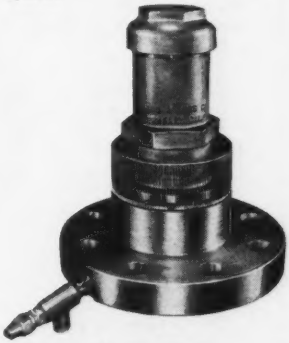
SHAND & JURS L.P.G. Valves listed by UL

Tested—and proved—Shand & Jurs Internal Hydraulic Safety Valves for L.P.G. tank discharging are now listed by Underwriters Laboratories, Inc. This impartial stamp of approval comes from the foremost testing organization in the country, whose findings are accepted by every Fire Insurance company, Fire Prevention bureau and many courts.

What does this mean to the L.P.G. transporter? He can be assured that Shand & Jurs Internal Hydraulic Safety Valves for discharging L.P.G. tanks will provide real safety and dependability, preclude loss of valuable products through accidents such as collision or contiguous fire, and reduce L.P.G.'s chance of endangering operating personnel, the public and equipment. Contact the factory or the nearest S&J branch listed below for complete information on how to make L.P.G. tank discharging safe.



S&J Fig. 13810
¾" Internal Safety Valve designed expressly for discharging L.P.G. tanks. Can be opened only by S&J Operator which is a part of this system.



S&J Fig. 13800
2" and 3" hydraulically operated Internal Safety Valve designed for L.P.G. tank discharging.

Shand and Jurs Co. 917 CARLTON STREET · BERKELEY · CALIFORNIA

NEW YORK 295 Madison Ave. · CHICAGO 10409 S. Western Ave. · HOUSTON 614 M & M Bldg. · TULSA 310 Thompson Bldg. · LOS ANGELES 714 W. Olympic Blvd · SEATTLE 3000 Western Ave.

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"Eternal Vigilance"

—THE PRICE OF SECURITY!

WHETHER IT BE NATIONAL OR INDIVIDUAL PERFORMANCE . . . SECURITY IS ACHIEVED ONLY BY THE EVER-ALERT, EVER-CAPABLE AND EVER-DEPENDABLE!

All of these requisites for SECURITY against loss of life and property by fire are provided through the "ETERNAL VIGILANCE" of

STAR AUTOMATIC SPRINKLERS

Automatic Sprinklers
Corrosion-Proof Sprinklers
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Alarm Devices

Automatic Releases
Standard Wet Pipe Systems
Dry Pipe Systems
Deluge Systems
Heat-Actuated Devices
Pre-Action Systems

Star Automatic Sprinklers and Fire Protection Devices bear approval of all Insurance Authorities having jurisdiction and various Governmental Agencies.

Economy in installation cost and maintenance has dictated the consistent policy of Star Sprinkler Corporation in distributing its Fire Protection Devices through local licensed contractors who have had a lifetime of experience in the installation of automatic sprinkler systems. Operating throughout the United States, Canada and South America, Star licensees, due to their strategic locations, can render instant service. Write us for name and address of Star licensed contractor nearest your location.

STAR SPRINKLER CORP.

Westmoreland and Collins Sts. — Philadelphia, Pa.

M & H VALVE
AND FITTINGS COMPANY
ANNISTON, ALABAMA

The established line of M & H Standard Compression Type Fire Hydrants is now available with Standardized Mechanical Joint end connection, for use with Cast Iron Pipe.

Mechanical Joint features are: Ease and speed of installation, construction economy, joint deflection, leak-tight, long life. Used with AWWA Class A, B, C, D; Federal Spec. WW-P-421; or Class 100, 150, 200, 250, centrifugal pipe.

M & H Hydrants can be supplied in accordance with A.W.W.A. specifications or Underwriters' Laboratories and Associated Factory Mutuals Laboratories tested and approved.

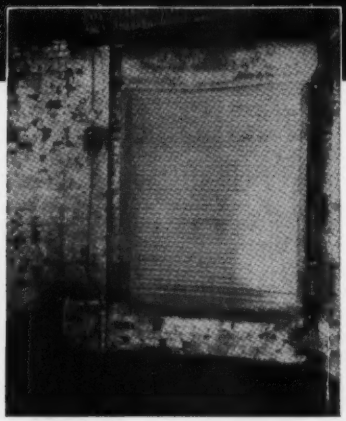
WRITE FOR
CIRCULAR No. 49

Our New Circular No. 49 shows important installation dimensions of M & H AWWA Mechanical Joint Hydrants and Valves . . . and Mechanical Joint Cutting-In sleeves.

M & H Products - Everywhere

FIRST 3-hour Rolling Fire Door!

Approved since 1939 by the Board of Standards and Appeals of New York City



The two "Akbar" Fire Doors above are on opposite sides of a fire-wall opening. Fire gutted the building on one side of the wall, as shown in the photo at left, but did not pass through either of the "Akbar" Doors.

"AKBAR"

The famous Kinnear Rolling Fire Door

- "AKBAR" Doors, *made only by Kinnear,* were the first steel rolling doors approved by the Board of Standards and Appeals of New York City.
- A strong push-down spring gives "AKBAR" Doors a positive downward start when automatically released.
- Downward speed of "AKBAR" Doors is *controlled,* for greater safety to building occupants.
- Safety device prevents steel curtain from pulling loose at top or falling below floor level.
- "AKBAR" Doors of hand lift type can be raised after automatic closure, for emergency exits, and will close again automatically.
- "AKBAR" Doors can be equipped for regular daily service use, with motor or manual control.
- "AKBAR" Doors, often concealed above door lintel, remain out of the way, out of view, until used.
- Rugged interlocking steel-slat construction gives extra years of trouble-free service. Built in various sizes, easily installed.

Saving Ways in Doorways

KINNEAR

ROLLING DOORS

The KINNEAR Manufacturing Co.

Factories: 2250-70 Fields Ave., Columbus 16, Ohio
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Offices and Agents in All Principal Cities

FASTER... MORE EFFECTIVE FIRE CONTROL

with the ANSUL *Stream Pattern*

why **Advertise the Nozzle! . . .**

. . . because the **nozzle** on your ANSUL Dry Chemical Fire Extinguisher is **water-tight** . . . it **won't** become inoperative due to corrosion or caking of dry chemical within the working parts . . . the most inexperienced man in your plant **can use the ANSUL extinguisher effectively . . . and only *Ansul has a nozzle*** to meet all of these requirements!

If your hazards require special long range straight stream nozzles, you can get Ansul Extinguishers equipped with these nozzles at no extra cost. With Ansul Dry Chemical Fire Extinguishing Equipment you have not only the best fire protection but also a choice of models and designs to meet your requirements.

Exclusive Features — Water-tight construction. • Provides modified cone-shaped stream pattern without hole in the center of the stream. • Each nozzle gas pressure tested after assembly. • Special spring loaded packing to insure lasting water-tightness. • Designed for use by inexperienced operators. • Low velocity, more effective stream of dry chemical.

Send for File No. 653. You will receive our latest catalog, a Periodic Inspection Record Chart, "Fundamentals of Fire Extinguishment" and information about Ansul Dry Chemical Piped Systems for automatic protection.

ANSUL
CHEMICAL COMPANY
FIRE EXTINGUISHER DIVISION
MARINETTE • WISCONSIN
DISTRIBUTORS
IN ALL PRINCIPAL CITIES IN THE U. S. A., CANADA AND OTHER COUNTRIES

"PLUS-FIFTY" DRY CHEMICAL IS MORE DEPENDABLE *ALL-WAYS!*

THIS TRADE MARK ASSURES YOU OF QUALITY PRODUCTS

Important savings may be effected by the proper classification of business documents.

The authoritative National Fire Protection Association (NFPA) lists four separate types of documents: Class 1 (VITAL), Class 2 (IMPORTANT), Class 3 (USEFUL), and Class 4 (NON-ESSENTIAL).

It's not necessary to store non-essential papers in a vault, safe, insulated container or insulated file—constructed for maximum protection under all conditions. Conversely, it is false and dangerous economy to house vital papers in a safe container designed only for limited protection.

Good management dictates an approach to the question of safe-equipment that offers *the soundest record-protection at the lowest cost.*

Your local safe-equipment representative will be more than happy to advise you on document classification, and on the safety-ratings of your present equipment. He's a good man to know. Consult him today.

DIEBOLD, INC., Canton 2, Ohio	**PROTECTALL MFG. CO.**, Syracuse 4, N.Y.
HERRING-HALL-MARVIN SAFE CO., Hamilton, Ohio	**REMINGTON-RAND, INC.**, New York, N.Y.
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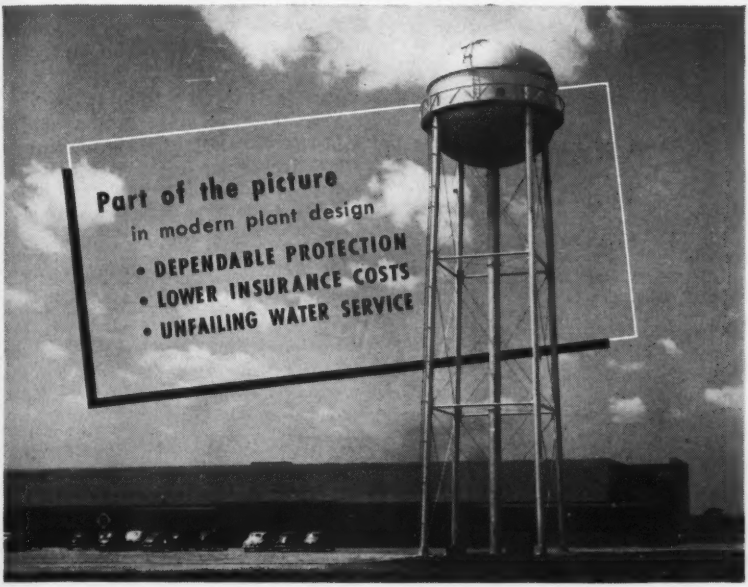
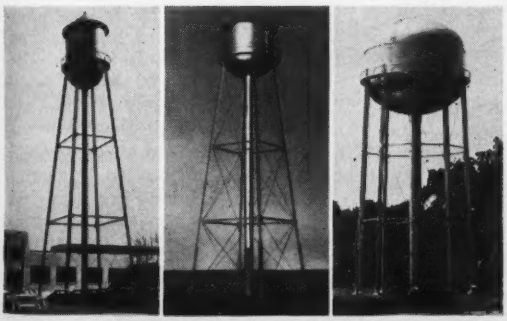


PITTSBURGH • DES MOINES *INDUSTRIAL*

Elevated Steel Tanks



Choose the Pittsburgh-Des Moines Elevated Steel Tank meeting your precise requirements in type and capacity, and you will enjoy every benefit of safe and certain water supply—at lower cost—*with guaranteed dependability.* Write for our latest "Modern Water Storage" Brochure.

PITTSBURGH • DES MOINES STEEL CO.

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Sales Offices at:

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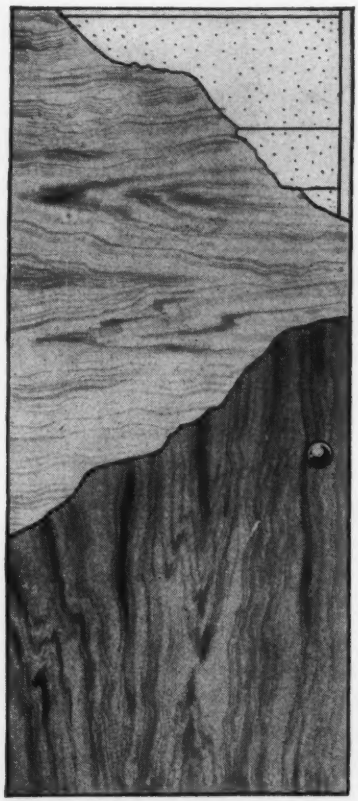
DES MOINES (8). . . . . 969 Tuttle Street
DALLAS (1). . . . 1273 Praetorian Building
SEATTLE . . . . . 976 Lane Street
SANTA CLARA, CAL. . . 675 Alviso Road

Keep Fire Out with

Look at this practical construction:



Specifications:

WELDWOOD® FIRE DOORS, for use in Class "B" or lower classification locations, are approved by the Underwriters' Laboratories, Inc., and labeled accordingly. Available with or without 10″ x 10″ light openings, centered left to right in the door at eye level.

FACE VENEERS are thoroughly kiln-dried hardwood of standard thickness—1/28″—and smoothly belt sanded. Rotary cut unselect birch is standard; other sliced or rotary cut domestic or foreign woods are available.

THE KAYLO* CORE is an incombustible mineral composition having a nominal density of 20 pounds per cubic foot. The core sections are joined together with tongue-and-groove joints, as approved by the Underwriters' Laboratories, and smoothly sanded prior to application of crossbands and face veneers.

CROSSBANDS are thoroughly kiln-dried hardwood, 1/16″ thick and extending the full width of the door.

THE EDGE BANDING is of birch treated with Class "A" fireproofing agent. The top banding is ½″ thick; the side banding ¾″; and the bottom banding 1½″, made by laminating two ¾″ pieces.

WATERPROOF RESIN GLUE is used to bond the edge banding to the core.The entire core is sized two sides to insure perfect glue bond between core and crossband. The core, crossband and face veneer are bonded with waterproof Tego film phenolic glue by the hot plate process.

SIZES—The thickness of all Fire Doors is 1¾″. Available in range of standard sizes up to, and including, 4′ widths.

LOW HEAT TRANSMISSION

Weldwood Fire Doors have remarkable insulating qualities, maintaining reasonably low temperatures in the protected area so that heat cannot damage contents or start a new blaze. In a recent test the temperature of the unexposed face of a Weldwood Fire Door stayed down to less than 400° F. after one hour's exposure to flame; compared with almost 800° for a kalamein door and 1100° for a hollow metal door.

**T.M. Reg. Owens-Illinois Glass Co.*

WELDWOOD *FIRE* DOORS

. . . as BEAUTIFUL as they are safe!

Every door in the offices of Beatty & Oliver, Inc., 37 Wall Street, New York, is a Weldwood Fire Door.

600 Weldwood Fire Doors are used in the new office building at 505 Park Avenue, New York. In these days of ever-rising building costs, it's a big help to find such beautiful, practical doors available at moderate cost.

One of the attractive walnut Weldwood Fire Doors used throughout the Skouras Theatre Corp. Building in New York.

Weldwood Fire Doors provide assured fire protection with the beauty of fine wood paneling. Standard faces are birch veneers, but a wide variety of other handsome hardwood veneers is available on special order. Weldwood Fire Doors are durable, vermin- and decay-proof and are guaranteed against warpage and dimensional changes.

When planning hospitals, hotels, schools, offices, apartment houses and institutions, be sure they have the protection and beauty which these doors offer.

WELDWOOD FIRE DOORS

Manufactured and distributed by

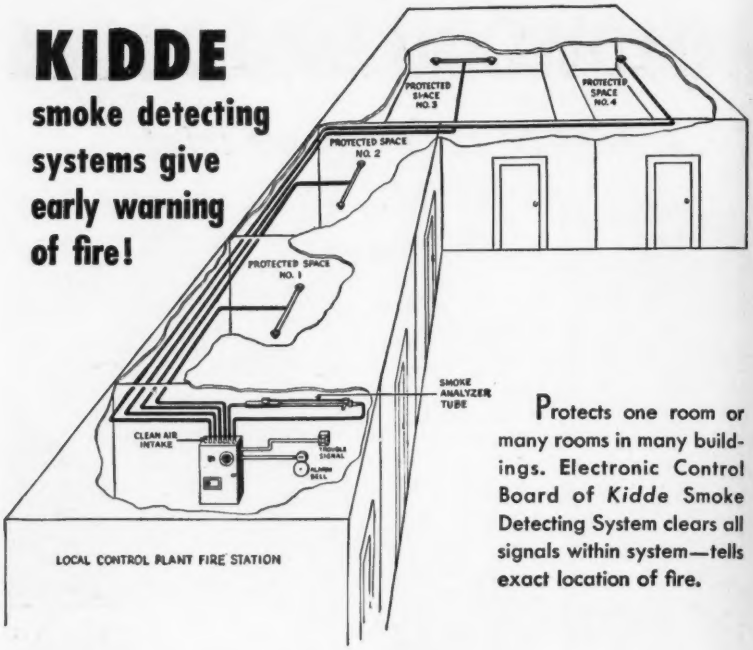
UNITED STATES PLYWOOD CORPORATION

55 West 44th Street, New York 18, N. Y.

Branches in Principal Cities • Distributing Units in Chief Trading Areas • Dealers Everywhere

KIDDE

smoke detecting systems give early warning of fire!



Protects one room or many rooms in many buildings. Electronic Control Board of *Kidde* Smoke Detecting System clears all signals within system—tells exact location of fire.

Most fires give off smoke first! *Kidde* Smoke Detectors can protect the largest building, room by room, and vault by vault —24 hours a day.

Before flames are visible . . . before heat gives warning . . . the smoke detector sounds an alarm at a central station and tells exactly where fire has started. Warning is automatic, no manual attention is needed.

Let a Kidde representative give you the full story on the most modern and effective fire fighting team imaginable— *Kidde* Fire Detection and Protection Systems.

Kidde Extinguishers carry highest rating of Underwriters' Laboratories and The Factory Mutuals

Kidde

Walter Kidde & Company, Inc., 151 Main St., Belleville 9, N. J.

In Canada: Walter Kidde & Company of Canada, Ltd., Montreal, P.Q.

Fiberglas* Coated Duct Insulation has it!

Listing by the Underwriters' Laboratories, Inc. is another *first* for Fiberglas Coated Duct Insulation. Based on their tests it is now universally accepted by insurance interests as a *fire retardant* material . . . also *no panic hazard,* no toxic fumes because smoke developed is negligible.

To rating engineers this means *impartial* assurance that the use of Fiberglas Duct Insulation, especially in concealed spaces, provides greater fire protection . . . more lasting protection because of the natural properties of the basic material, ageless fibers of glass. OWENS-CORNING FIBERGLAS CORPORATION, Dept. 117-A, Toledo 1, Ohio.

OWENS-CORNING
FIBERGLAS
THERMAL INSULATING MATERIALS

*Fiberglas is the trade-mark (Reg. U. S. Pat. Off.) for a variety of products made of or with glass fibers by Owens-Corning Fiberglas Corporation.

FIBERGLAS IS IN YOUR LIFE—FOR GOOD!

"Automatic" AER-O-FOAM FOR INDUSTRY

Considered to be one of the foremost recent advancements in the science of fire protection, *Automatic* AER-O-FOAM has opened new avenues in fire safety which heretofore were not thought to be practical or economically feasible. Hazardous conditions familiar to chemical processing industries, metal working plants, petroleum storage and handling, electric power generation, and other occupancies where flammable liquids are involved, can now be fully safeguarded by engineered *Automatic* AER-O-FOAM protection.

A hydrolyzed protein, manufactured from a soya bean base, AER-O-FOAM, when mixed with water and aerated, forms a smothering tenacious blanket capable of flowing around obstacles. The system is set into operation "Automatically" through the quick response of highly sensitive Rate-of-temperature-Rise heat detectors and allows for the speedy extinguishment of fires involving gasoline, benzol, naphtha, and many other flammable liquids.

This form of protection also provides important engineering advantages evidenced in the improvement of drainage conditions, reduction of water supply requirements, non-corrosive action of the foam material and prevention of re-flash. As *Automatic* AER-O-FOAM dehydrates rapidly following application, clean-up operations are practically non-existent.

Better investigate the advantages of *Automatic* AER-O-FOAM protection for those stubborn fire areas in your plant. More detailed information is available through your nearest *Automatic Sprinkler* representative. He'll be happy to furnish you with surveys and estimates without cost or obligation. Write or call today.

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN 1, OHIO

"Automatic" Sprinkler

FIRST IN FIRE PROTECTION

DEVELOPMENT . ENGINEERING MANUFACTURE . INSTALLATION

OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

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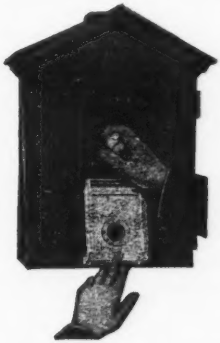
GAMEWELL

Municipal Fire Alarm Systems

Until the Fire Department knows there is a fire — and the exact location — it can do nothing about it.

For the protection of the values at risk — human life, property, business and income — adequate fire alarm box distribution is a sound investment.

The Standard Municipal Box



GAMEWELL Three-Fold Type

INDUSTRIAL FIRE ALARM SYSTEMS

We also supply complete systems for industrials and institutions. Write for our catalog descriptive of the Vigilarm System of Automatic Fire Detection.

THE GAMEWELL COMPANY

Newton Upper Falls 64 - Massachusetts

Protection for Defense

World conditions again force our country into a national defense program. Industry faces overloaded production schedules, concentrations of personnel and equipment, stocks of highly flammable materials, warehouses filled with raw or finished supplies. Speed, carelessness, possibilities of sabotage . . . all will drastically increase the danger of fire.

Fire must not be permitted to interrupt or undermine this vital program of production and preparedness!

There is a type of Grinnell Fire Protection System for practically every fire hazard. These Systems have proved to be the most dependable defense against fire for over 80 years. Complete information is available for the asking from any of our offices in principal cities. Grinnell Company, Inc., Providence 1, R. I.

GRINNELL SYSTEMS

For Protection Against Fire